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Journal of the Society of Arts.

FRIDAY, FEBRUARY 27, 1857.

SPECIAL GENERAL MEETING.

Thursday, Feb. 19, 1857.

A Special General Meeting of the Society, duly convened for the purpose of altering certain of the Bye-laws of the Society, and making new Bye-laws, was held on Thursday, the 19th inst., the Rev. Dr. Booth, F.R.S., Treasurer, in the chair, when it was unanimously resolved that the following additions be made to the existing Bye-laws, viz.:—

Union of Colonial Scientific and Literary Institutions.

Any Institution, established in a British colony, or in the British possessions in India, for the advancement of Literature and Science, or for the encouragement of Arts, Manufactures, and Commerce, may be admitted into Union.

It shall be the duty of the officers of the Society of Arts to correspond with the secretaries of such Associated Colonial Institutions, on matters relating to their recognised objects.

The productions or manufactures of a colony, transmitted by a Colonial Associated Institution, shall receive all due publicity, by means of the Society's Exhibitions, publications, and discussions.

The weekly *Journal* of the Society, with its other publications, shall be duly forwarded to every Associated Colonial Institution, and a portion of the columns of the *Journal* shall be reserved for colonial discussions and correspondence.

Whenever any member of an Associated Colonial Institution, bearing a letter of introduction from its Secretary, shall visit London, he may enjoy the usual privileges of a corresponding member of the Society of Arts during his stay, and may have his letters addressed to him at the Society's House in the Adelphi.

The Council will afford their advice and assistance to any Colonial Associated Institution which may desire to obtain in England or France any scientific or educational apparatus, and will obtain and furnish to any colonial associated Institution reports on any produce sent over for examination.

A Colonial Associated Institution shall have the privilege of purchasing books through the Society's agency on the same scale of reduction as is now granted to Home Associated Institutions.

The system of examination proposed to be instituted by the Society of Arts shall be extended so as to embrace candidates who shall have duly attended classes at Colonial Associated Institutions, and certificates of merit shall be awarded by the Society's examiners on examination papers duly authenticated and remitted from the Colonies.

A Colonial Institution may be admitted into Union on the same terms as a Home Institution, namely, an annual payment of two guineas.

Honorary Local Secretaries.

To multiply the centres of the Society's operations, and to direct the energies of many who are prepared zealously to aid it, the Council may invite gentlemen of standing and of influence in their respective neighbourhoods to undertake the office of Honorary Local Secretary of the Society of Arts.

The Honorary Local Secretaries shall receive the Society's *Journal* and other published documents from time to time; and the facilities of an office for receiving and forwarding letters, books, &c., shall be afforded them at the Society's House in the Adelphi.

The Honorary Local Secretaries will be expected to advise the Council on such matters as may be submitted to them, and to afford generally their aid in promoting the objects of the Society.

The Honorary Local Secretaries shall go out of office annually, with the Council and Officers, but may be reappointed after the annual election of the Council of the Society. Their names shall be published with those of the President, the Council, the Board of Examiners, the Committees of Reference, and the Officers of the Society.

The Board of Examiners.

To carry into operation the system of Examinations established by the Society, a Board of Examiners shall be elected from year to year, in manner and form following:—

On the first Wednesday in November, in each year, the Secretary shall summon all the members of the Board of Examiners to a meeting, due notice thereof having been previously given; and the members assembled, three being a quorum, shall proceed to nominate the persons whom they propose to be members of the Board of Examiners for the ensuing year.

The Secretary shall cause a list of the names, thus proposed, to be printed and sent to each member of the Board duly summoned, at the same time, to attend a meeting of the Board of Examiners on the second Wednesday in November. The Board of Examiners shall then proceed to select, by ballot, the persons who are to constitute the Board of Examiners for the ensuing year. No person shall be so selected unless he shall have had a majority of the votes of the persons then present and voting.

The Chairman of the Board of Examiners shall certify under his hand to the Council the names of the persons so selected to act as the Board of Examiners of the Society of Arts. The list of selected names being submitted to the Council duly summoned, for confirmation, it shall be competent for the Council to erase the name or names of any of the proposed Examiners from the list, and having confirmed the remainder and appointed them to be the Board of Examiners for the ensuing year, to require them to proceed to nominate other fit persons to supply the vacancies in the Board of Examiners.

Whenever a vacancy shall from time to time occur in the Board of Examiners, it shall be competent for the Board duly summoned to proceed to nominate in the manner before described a person to fill the said vacancy. And on his selection being confirmed by the Council, he shall be admitted a member of the Board.

Should the Council at any time, on the representation of the Board of Examiners, think proper to increase the number of Examiners, the election shall take place in the manner before described.

The Board of Examiners shall elect a chairman on the third Wednesday in November. He shall be elected by ballot. The chairman of the Board of Examiners shall *ex officio* be entitled to be present at all meetings of the Council, and shall be duly summoned thereto.

The Board of Examiners shall not vacate office with the Council, Officers, and Committees annually in June, but shall continue to hold office until the appointment of the succeeding Board in November.

It was also resolved unanimously, that the word "collector"* be struck out entirely in the existing Bye-laws.

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* The object of this alteration is simply to substitute the shorter title of "Financial Officer," for the title "Financial Officer and Collector," the duties of the officer remaining precisely the same as hitherto.

THE SOCIETY'S EXAMINATIONS AND COMMERCIAL SCHOOLS.

———— Commercial School, Feb. 19, 1857.

Sir,—Several of my boys are preparing to go up to your examinations in June. As the Society of Arts Examinations are to take place in the beginning of June, which is just the middle of our quarter, I am wishful to know whether there would be any objection on the part of your Society to a young man, who should have passed your examination, coming back for the residue of his quarter, or longer if he felt so disposed. I think this would be important, as it would afford a youth an opportunity to try again and work harder. Hoping you will excuse this trouble.

I am, Sir, yours, &c.,
* * * *

The Secretary of the Society of Arts, Adelphi, London.

(REPLY.)

Society of Arts Adelphi, London, Feb. 23, 1857.

Sir,—I am directed by the Council of this Society to state, for your information, in reply to your communication of the 19th inst., that the Society of Arts did not institute its examinations to ascertain the progress that schoolboys were making, but to test the final result of a School Education, in any given case that might come before their examiners. The Council will, therefore, in every case, rigidly enforce the rule "That no person intending to return to school shall be eligible for examination." The examinations are intended to test the acquirements of young men when entering on the duties and undertaking the responsibilities of life, not to classify schoolboys.

I am, Sir, yours, &c.,
P. LE NEVE FOSTER, Secretary.

To ————
Head Master of ————

EXAMINATION PRIZE FUND.

The following donation has been received since the last announcement:—

J. Harvey Lewis, Esq., £10 10s.

CONVERSAZIONE.

The first Conversazione of the present Session was held on Saturday evening last. when the attendance was unusually large. All the rooms were thrown open, and contained a fine collection of objects of interest.

In the lower rooms were arranged numerous specimens of Art-manufactures in enamel, gem work, gold and silver plate, bronzes, electro deposits, stained glass, fictile wares, tapestry, &c.

The following were the principal contributors, to whom the thanks of the Society are especially due:—

Mr. Joseph Angell, of the Strand.

Large group, in silver, of Sir Roger de Coverley and the Gipsies, from the *Spectator*. An original design; modelled by Henning. Weighs about 340 ounces.

An enamelled tea and coffee equipage, comprising coffee pot, tea pot, cream ewer, and sugar basin, silver gilt, and displaying in contrast the bright silver in line engraving, ornamented with medallions of purple and green enamel. The first specimen ever manufactured. (Mr. Angell claims the first introduction of enamel into articles of this description.)

A chased tea and coffee equipage, in frosted silver, relieved with turquoise enamel, a very delicate and elegant contrast.

A large silver chalice, "repoussé" work, twenty-four inches high, richly gilt and embellished with medallions in enamel of the sapphire, emerald, turquoise, and amethyst colour: original design.

Silver and silver-gilt tankards, inlaid with enamel, an elegant specimen of silver-gilt and enamelled sacramental plate; also equestrian figures in silver gilt.

Messrs. Chamberlain and Co., of New Bond-street.

Figure—"Lady Macbeth," porcelain, in imitation of ivory and oxidised silver.
Vase and cover—"Triumph of Galatea."
Vase—Blue Raffaellesque, richly gilt.
Vase—Painted, "The Seasons," and richly gilt.
Vase—Dark blue, with gilt snake handles.
Vase and cover—Dark blue and gilt, with flowers.
Vase and cover, oval—Turquoise with painted cupids.
Vase and cover, oval—Turquoise with painted cupids, Sèvres shape.
Harewood bottles and covers—Dark blue and gold, with turquoise stones.
Clodion vases—Parian, gilt.
Candlesticks—Porcelain, in imitation of ivory and oxidised silver.
Limoges enamelled vase—Dark blue.
Limoges enamelled tazza and cover—Dark blue.
Limoges enamelled Patera—Dark blue.
Tea-cup and saucer, egg-shell ware—Parian, decorated with grass and butterflies.
Tea-cup and saucer, Jenny Lind ware—Pierced Parian, gilt, and decorated with ivy.
Jenny Lind bottles with stoppers.
Jenny Lind milk jug.
Triumphora—Various patterns.
Parian ewers—gilt.
Jenny Lind cups and saucers—Painted.
Tazzas—Dark blue, painted with roses and gilt.
Small square trays—Sèvres shape.
Inkstand—Painted with flowers.
Cabinet cups and saucers—Various patterns.
Parian figures—"Rebecca and Ruth."
Parian group—"Boy and Goats."
Parian group—"Boy and Dolphin."
Large and small garden-pots and stands—Majolica.
Queen's vase, chocolate ground—Majolica.
Marine vase, blue, &c.—Majolica.
Parian flower vases with glass linings.
Parian jug—Blue stars and gilt.
Dessert service—White and gold, pierced.
Dinner plates—Blue and richly gilt.
A fine service of cut glass.

Messrs. W. P. Copeland, of New Bond-street.

Groups of "David and Goliath," "Burns and Mary," "Golden Age," and "Rebecca at the Well," in statuary porcelain.
Two Verulam bottles, statuary porcelain, painted with heaths and gold cord.
Two vases, statuary porcelain, jewelled and gilt.
Large and small two-handled renaissance vases, coloured and gilt.
Coral centre piece.
Six dessert plates, China, painted and gilt.
Armada bottle, China, blue ground, jewelled and gilt.
Two-handled Pompeian vases, China, painted with flowers and gilt.
Two plain-shaped vases, China, painted with flowers and gilt.

Cord-handle bottle, China, blue ground, jewelled and gilt.

Three Victoria covered vases, Rose du Barry grounds, painted.

One Victoria covered vase, blue grounds, flowers and gilt.

Two Sutherland vases, pink ground, painted with flowers and gilt.

Tile, China, green ground, painted and gilt, mounted in gilt frame.

Messrs. Daniell, of Bond-street.

Vases and plateaux in Limoges ware, a pair of vases and ice-pails, Rose-Dubarry; pierced baskets, Dresden ware; vases with cupids and scroll, card tray, flower-pots in Majolica, &c.

Messrs. Elkington and Co., Regent-street.

Flower-stand, designed by Mr. L. Gruner, a cornucopia, terminated with ram's head, gilt, and relieved by oxidised silver.

Flower-stand, gilt and oxidised, designed by the late Mons. E. Jeannest.

Flower-stand, open work, with statuette of a gardener in centre, designed by Jeannest.

Large-size ivy vase, for flowers, from the original in the Royal Gallery at Naples.

Flower vase, designed by Mr. C. Grant. Subject of the reliefs from the story of Galatea.

Tazza, with group of boys for the pillar, designed by Jeannest.

Tripod tazza, the feet terminated with ram's heads, the top being from a reduction of the shield with the Battle of the Amazons.

Tazza, from one in the possession of J. Auldjo, Esq., F.R.S. The original found near Calvi.

Casket—A cradle with guardian angel, designed by Jeannest.

Casket, enriched with reliefs and enamels, by Jeannest.

Casket, with subjects (in chasing) from the history of Maximilian, Emperor of Germany.

Inkstand, with bas-reliefs, "The Seasons," designed by G. Stanton.

Inkstand, composed from a foot-lamp found at Herculaneum.

Tankard, in oxidised silver, relieved by gilding, from an ivory one in the possession of Henry C. G. Bedford, Esq.

Jug, enriched with figures of cupids, in bold relief, designed by Jeannest.

Sideboard dish, designed by C. Grant, from Homer's Iliad.

Shield, copied for the schools of design, from the original in the Royal Armoury at Windsor Castle, which was presented by Francis I. of France to Henry VIII. The work attributed to Cellini.

Shield, copied from one in the Tower of London. Subject—The Conversion of St. Paul.

Helmet, copied from one in the Tower of London.

Medallion, in commemoration of the achievements of the late Duke of Wellington, designed by Jeannest.

The Earl of Leicester and page, attending Queen Elizabeth, being a reduced copy of the group exhibited in Hyde-park, 1851.

Charles I. discovering his Standard Bearer, on the field at Edge-hill.

Queen Henrietta Maria, meeting Prince Rupert on the way to Edge-hill. The above three groups are from portions of the history of Warwickshire; and the full-sized groups were made expressly for the Warwick races, for which several other pieces have been produced by this firm, from models by Jeannest.

Pair of Candelabra, with figures in German military costume, by Jeannest.

The foregoing series of specimens are enriched with oxidised silver relieved with gold.

Mr. David Falcke, of 92, New Bond-street.

Large antique silver salver. Subject: Esther and Ahashuerus.

Large Italian silver tankard.

Crystal and silver gilt tankard, chased.

Silver-gilt ewer—Louis XVI.

Large silver and parcel-gilt tankard (16th century), engraved with arms.

Large chalice and cover, 24 inches high.

Domestic articles in silver, formerly used as drinking vessels:—Silver gilt ox, silver bear with a ragged staff, silver lion and peacock, silver-gilt huntsman, silver gilt horse, silver cock (parcel-gilt), silver-gilt stag, and silver-gilt owl.

Fine carved cocoa-nut cup, mounted and chased.

Two boxwood figures, mounted in silver-gilt; inscriptions round the top, "Thomas Weilant, Jacob Harmsturffer, Hans Hoffer. Anno Domini 1629," and the initials "A. L." at the back of each of them.

Boxwood figure, mounted as a drinking cup, with numerous badges and arms. A.D. 1679.

Silver tankard, engraved with figures. 16th century.

Early Gothic cup and cover, of great beauty.

Fine old Italian salt-cellar, foot supported by monsters, dragons, and dolphins, surmounted by a figure of Neptune.

Nautilus shells of Italian and German art.

An extraordinary ivory cup and cover, by François Flamands, "Feast of Bacchus." Originally from Colonel Sykes' collection, then from that of the late Colonel Sibthorpe.

Two fine silver salt-cellars. (Period of the Renaissance).

Gothic wine cup on three feet, engraved all over with arabesque and masks, enamelled in various colours.

Chef, very rare and curious, of Byzantine art, studded with gems. Date 1300.

Fine copy of one of the original Portland vases, by Wedgwood, in good preservation.

A collection of rare eastern arms, consisting of guns, dirks, shields, swords, and pistols, elaborately chased in silver, and richly inlaid with gold.

Several vases in Chinese enamel, bottles, &c.

Mr. G. Franchi, of Myddleton-street.

Several electro-deposits from original shields in the Musée d'Artillerie, at Paris. Subjects: "The Head of Pompey brought to Cæsar," "The Laocoon, &c., &c.

A similar specimen from the Louvre. Subject: "Siege of Algiers, by Charles V."

Electro-deposit of small target, from the collection of the Count de Nieuwerkerke, at Paris.

Electro-deposit of shield in the same collection. Subject: "Judith with the Head of Holofernes," and "Decapitation of John the Baptist."

Electro-deposit of leaden plates by Briot, from Marlborough-house. Subjects: "The Prodigal Son," &c.

Electro-deposits from ancient ivories in the British Museum and the Louvre.

Electro-deposit from an original marble, by Jean Goujon. Subject: "Portrait of the Sculptor's Daughter."

Casts in fictile ivory. Subjects: "The Crucifixion and the Baptism of Christ," "Christ Crowned with Thorns," &c.

A series of specimens in fictile ivory, with copper bronzed surfaces.

Messrs. Hunt and Roskell.

An Etruscan cup and cover, an Etruscan wine cooler, the Portland vase, an ice-pail with ruby glass lining, Mazeppa group, Peter the Great (Ascot cup), a Silenus tankard, and a figure of Victory, all in silver.

Messrs. Jackson and Graham, of Oxford-street.

A specimen of old tapestry. Subject—Esther.

Messrs Jennens and Bettridge, of London and Birmingham.

A very beautiful vase, produced by a patented process called, "gem enamelling." A pair of similar vases designed by Gruner, were manufactured for H.R.H. Prince Albert.

Messrs. Lambert and Rawlings, Coventry-street.

Two finely-chased gilt Tazze, Italian manufacture, "Moses striking the Rock," "Christ and the Woman of Samaria at Jacob's Well."

Fine Cup and Cover 12 inches high, composed of Coins. Obverse, Portraits. Legend, "Christian John, George and Augustus." Reverse, "Frat: et duces, Saxon:" 1594, mint marked HB. Bottom of the Cup, a Coin, obverse a savage. Legend, "Deo and Patria," Anno 1619. Reverse, "Anne of Brunswick and Lunneburg." Legend, "Fredric: Ulri dux Brunswic et Lunnebur." Cover, a Coin, obverse two savages holding two boughs. Legend, "Ut frontibus ita frondibus coniunctissimi." Reverse, "Arms of Brunswic and Lunneburg." Legend, "D. G. Rud: Aug. et Anth: Ulr: D.D. Bret Lu. Date 1685," surmounted by a figure of a savage, holding a bag and ingot.

Fine silver-gilt Hanap, supported by a figure standing on one leg.

Fine ivory Tankard, (reputed) by Fiamingo, "Boys assisting at a Vintage."

Magnificent antique alto-relievo chased silver-gilt Tankard, 13 inches high by 6 inches diameter. Subject: Bacchanalian figures dancing.

Antique German Tankard, Nymphs and Satyrs. This fine specimen of work has the cover and foot of filigree work, a ducal coronet and J.W. reversed.

Fine Spanish silver-gilt Chalice, with six old enamels encircled with gems.

Fine Mulberry Hanap. Antique German silver-gilt Tankard, chased.

Fine Italian silver-gilt Chalice. Subjects: From the Parables.

Richly chased silver-gilt German dish, fruit and scroll border and figures in a garden. A ditto to match, "A Supper Party."

Fine German silver-gilt Shield, figures in Alto-relievo, from ancient mythology.

Fine "Couteau de Chasse," Damascus blade. Handle, Stag's head, and antlers on the guard. Two figures, in Ancient Hunting Costume.

Mr. Page, of Whitechapel-road.

Specimens of pellucid chromatic embossed glass.

Messrs. Thomas Pearce and Son, of Ludgate-hill.

Bronze statuette of Spartacus.
Bronze statuette of Andromeda.
Two vases, with covers, after the antique.
Vase with bas-reliefs and olive handles.
Etruscan ewer.
Renaissance ewer.
Vase with relief after Clodion.
Grecian Candelabrum.
Candelabrum (conventional design).
Statuette of "Pandora," after Pradier's original.

In Sèvres porcelain—Etruscan ewer, decorated; Etruscan vase, decorated; low open vase, decorated.

In Parian—Mug, with open work; small vase, decorated with butterflies, &c.; ewer, with flowers in relief.

A series of vases to show the most recent style of decoration.

Triple flower stand—Bisque.
Ewer—Bisque.
Partridge in relief—Bisque.
Painting on China after Rubens.
Group in Parian—"The Angel's Mission."
Moderator lamps with figures in bronze.

Messrs. James Powell and Sons of Whitefriars.

Painted and stained glass, and patent embossed stained glass. Also, a series of specimens illustrative of the manufacture of articles of utility in plain, cut, engraved, moulded and coloured glass. The glasses after Venetian patterns, were good illustrations of the capabilities of our manufacturers to reproduce this class of works.

Mr. Samuel L. Pratt, of Bond-street.

A specimen of Tapestry of the 15th century.—Figures of Saints and a Bishop under canopies.

Two ovals of Italian Tapestry, of the period of Henry 8th.—"David slaying Goliah;" "David taking the spear &c., from the tent of Saul."

Five pieces of the period of Elizabeth, representing the "Parable of the Prodigal Son."

Eight pieces of Flemish Tapestry, dated 1725:—"The Adoration of the Magi;" "The Ascension;" "The Assumption of the Virgin;" "The Conversion of St. Paul;" "Christ Giving the Keys to St. Peter;" "Christ allaying the Tempest;" "Peter Walking on the Sea."

Two specimens of Gobelins Tapestry—Flowers and Arabesques, of the period of Louis XVI.

Several large pieces of tapestry of various periods, which entirely covered the walls of the room.

Messrs. Watherston and Brogden, of Henrietta-street, Covent-garden,

Exhibited their gold, enamelled, and jewelled vase, which obtained a prize medal in 1851, and a first-class medal in Paris, 1855. It is the largest piece of gold plate ever manufactured in this country, and is valued at 2000 guineas.

Copies of Etruscan, Pompeian, and Roman ornaments of jewellery, the originals being in the British Museum, the Louvre, and the Marquis Campana's collection, at Rome. There is great difficulty in attaining perfection in this class of work, the soldering filigree wire upon solid gold mounts being a far more delicate operation than when altogether filigree.

Messrs. Widdowson and Veale, of the Strand.

A flagon in frosted silver, repoussé work, with four compartments, illustrating the Life of Christ.

In the suite of rooms on the first-floor, were exhibited a fine collection of water-colour drawings, by Turner, J. D. Harding, Cattermole, Corbould, Stanfield, Danby, Warren, De Wint, Cox, and other eminent artists, as well as photographs, of unusual size, by Bisson *freres*, Baldus, and other distinguished French photographers. On the tables were displayed several sets of philosophical apparatus, optical instruments, &c.

The Crystal Palace Company lent from their picture gallery:—

Several fine water-colour drawings, and a series of the most recent and finest French photographs in their collection.

From the Literary Department, the following rare and splendid books:—

The King of Prussia's Testament, of which only four copies exist in England.
The Dresden Gallery, Vol. I.
Dickenson's pictures of the Exhibition of 1851.
Progress of the Sydenham Palace, two vols, (photographs).
Illuminated Books of the Middle Ages.
Etchings, by John Clerk, of Eldin.

The following gentlemen contributed water-colour drawings:—

H. Burton, Esq.; J. D. Harding, Esq.; John Henderson, Esq.; J. A. Rose, Esq.; Clarkson Stanfield, Esq., R.A.; George Stanfield, Esq.; Thomas Thorby, Esq.

Miss S. Durant contributed a fine bust in marble, by herself, of Mrs. Beecher Stowe.

Mr. W. Essex exhibited three enamels, painted by himself.

Mr. Louch—Three enamels, painted by Mr. W. Essex.

Mr. B. Waterhouse Hawkins—Models of the restored animals in the Crystal Palace.

Mr. Chief Justice Temple—25 Indian antiquities from British Honduras.

Messrs. Bland and Long exhibited stereoscopes and stereoscopic pictures.

Messrs. Elliott and Co., of Charing-cross, exhibited a set of philosophical apparatus for educational purposes, as approved by the Committee of Council for Education. Also Professor Willis's apparatus for teaching mechanics.

Messrs. Horne and Thornthwaite, of Newgate-street, a similar set of apparatus.

Messrs. Knight and Co., of Foster-lane, some improved stereoscopes.

Mr. Ladd, of Chancery-lane, some microscopes and microscopic objects.

Mr. Mayall, of Regent-street, stereoscopes and specimens of his patent artificial ivory photographs.

Mr. Williams, of Regent-street, some photographic portraits.

The only hindrance to a full examination of the numerous objects collected for the entertainment of the company, was the over-crowded state of the rooms. Several applications have been made by members, since the Conversazione, for an opportunity of studying the collections, but owing to the necessity of re-arranging the room for the Society's meetings, it has been impossible to comply with the requests made. This is, however, much regretted, and leads the Council to hope that the members will be induced to join with them in making a speedy and vigorous effort to obtain for the Society that enlarged accommodation which its constantly increasing numbers and the importance of its objects render so imperatively necessary.

TWELFTH ORDINARY MEETING.

Wednesday, Feb. 25, 1857.

The Twelfth Ordinary Meeting of the One Hundred and Third Session was held on Wednesday, the 25th inst., Colonel Sykes, F.R.S., Chairman of the Council, in the chair.

The following Candidates were balloted for, and duly elected members of the Society:—

Courtauld, Samuel.
Eyton, Price Ellis.
Foster, John Porter.
Key, Kingsmill Grove.
Myers, George.
Stopford, James Sydney.
Tagg, William.
Vigers, Edward, jun.

Previous to the reading of the paper, the Secretary called the attention of the meeting to three samples of raw sugar, the growth of the colony of Natal, brought before the Society by Mr. Thomas Hilton, who describes them of "very strong quality," and adds—

"The average cost of production of the samples shown is, at the outside, 11s. per cwt., and the market value of sample No. 1 is 40s. per cwt., in bond in London, or from 53s. to 54s. per cwt., duty paid. This important difference of value, coupled with the decreasing supply of sugars from other places to this market, has induced me to bring this matter before the Society. At the present time the sugar is grown only upon a small scale, but I can refer you to very high authority for the fact, that there is abundance of land in the colony, adapted for the growth of it, that can be bought from £1 per acre. It only wants capital and enterprise to make Natal a large sugar-growing colony."

The Paper read was:—

ON THE FACTORY OR HALF-TIME SYSTEM OF EDUCATION, AND ITS GENERAL APPLICATION.

By Alexander Redgrave (one of H.M. Inspectors of Factories).

It would be altogether superfluous, in this room, and before this audience, if I were to occupy even a moment in urging the necessity of the extension of education. That there does exist a want of education among the children of the labouring classes, is now almost universally acknowledged; the chief point of discussion is, the means whereby this want should be supplied. Among the plans which have been proposed for ensuring the education of the children of the labouring classes, the factory or half-time system holds perhaps, at this moment, the most prominent place. Many of those who do not recommend the adoption of the half-time system in its integrity, advocate a system which shall make attendance at school indispensable, under obligations, either pecuniary or moral. It has appeared, therefore, that an investigation of the only compulsory system of education in this country,—the factory or half-time system, a knowledge of its actual condition and of its results, would be most useful at the present moment, and I propose to submit to the consideration of the members of this Society, some of whom I believe advocate an extension of the half-time system, and all of whom are earnest promoters of education in all its phases, such facts as I have been able to collect in the execution of my office, showing the working of the half-time system, and, having done that, to offer some observations upon an extension of a compulsory system.

In examining the present condition of the half-time system of education, it will be necessary to inquire into its effects upon the employment of juvenile labour, upon the operations of trade, its results as a system for the education of the young, the educational position of the half-time scholar compared with its whole day contemporary; and, having fairly investigated these points, to inquire whether the system is, at the present moment, the best that could be adopted.

Prior to the year 1833, children employed in the factories received, as a class, no instruction whatever. There was no limitation of the age at which they might be admitted to work, there was no restriction upon their hours of work. Some manufacturers indeed had, prior to that date, established schools and required the attendance therein of the children employed by them; but, when the hours of work of children, of women, and of men, were alike unrestricted by custom as by law, no great educational advantages could be gained even in these factories. The surprise is, rather that any manufacturer should, in the days of unrestricted labour, have been willing to face the competition of the trade, voluntarily to surrender his position of equality, by placing any restriction which might influence disadvantageously the operations of his factory, even in a slight degree. The conduct of these gentlemen deserves the highest praise, and in speaking of the factory system, as it now exists, we must not forget that these were the pioneers to clear the way for the very salutary regulations which, for the last 20 years, have conferred many and great benefits upon the factory operatives.

It will be unnecessary to describe more of the provisions of the factory acts than as bearing upon juvenile labour. The half-time system is applicable only in establishments wherein steam, water, or other mechanical power, is used to propel machinery for the preparing, manufacturing, or finishing of any articles made of cotton, wool, worsted, silk, flax, hemp, or hair. Bleachworks, dyehouses, printworks, hat and lace factories, are exempted. Thus, factories for the spinning of cotton by steam-power, for the weaving of calico by water-power, for the finishing of woollen cloth by steam-power—are factories within the scope of the Factory Acts. But factories wherein silk, velvet, woollen goods are woven by hand, are not within the purview of the statutes.

In the factories in which power is employed the following are the regulations as to labour:—

The labour of men above 18 is unrestricted.

The labour of females above 13, and of males between 13 and 18, is thus restricted:—

The hours of work must be taken between six a.m. and six p.m., with 1½ hours out for meals, on the first five days of the week, and between six a.m. and two p.m., with half-an-hour out for meals on Saturdays, *i.e.*, 10½ hours on five days, and 7½ hours on Saturday = 60 hours per week.

The labour of children under 8 is interdicted. Children between 8 and 13 may only be employed either between 6 a.m. and 1 p.m., or between 12 at noon and 6 p.m.; they cannot be employed more than 6½ hours on any one day.

This is the class to which the half-time system applies, as half the day is spent in factory, the other part must be spent in school. Every child between 8 and 13 must attend school daily for three hours on five days in every week, between 8 a.m. and 6 p.m. The occupier of the factory is liable to penalties for employing a child the week following the omission of even one attendance at school, and for not having certificates signed by the school-master of every day's attendance at school of every child employed by him. The parent is also obliged, under penalty, to cause his child to attend school.

The half-time system of education consists of—

Daily attendance at school combined with half-time employment:

Daily responsibility of the employer and of the parent for the regularity of the school attendance for each child.

There is a compulsory system of instruction under a distinct act applicable to printworks, but it is of so doubtful a value, being merely the requirement of attendance at school for 150 hours in every six months, either continuously or at intervals, at the option of the child or its parents, and is carried out in so few establishments, that I need not notice it further in this place.

Such being the requirements of the law for preventing the excessive labour of children in factories, and for securing to them some opportunities of instruction, it is necessary to see what the effect of this direct application of the system has been, both with respect to the arrangement of labour in factories, and upon the employment, and consequent extension of education, of the children.

The half-time system supposes the employment of two children working half the day, to perform the labour of one child working all day; and, however surprising it may appear, yet it is a fact, that the immediate effect of the application of the half-time system, was to exclude from factory labour, and consequently from the intended advantages of education, one-half of the children employed for full time, and this will be best shown by reference to certain Parliamentary Returns which are discussed in the Joint Report of my colleagues and myself recently laid before Parliament.*

It appears that, in 1835, there were employed, in 2,929 cotton, wool, worsted, and flax factories, 47,373 children between 9 and 13 years of age; but as the Factory Act was then only in partial operation, but 17,147 of these children were then attending school, the remainder being employed for full time. Silk factories have been excluded from these comparisons because they were practically exempt from the restrictions of the Factory Act until 1844, and since that date they still have peculiar exemptions not awarded to other factories.

In 1838, the factory system was in full operation, and all the children between 9 and 13 years of age attended school, and were brought under the half-time system, rendering apparently necessary the employment of a greater number of children than were employed under a full-time system. In this year, returns were received from 3,949 factories employing 24,831 children, *i.e.*, a third more factories employed one-half the number of children—the number that ought to have been employed was between 70,000 and 80,000.

Another return was obtained in 1850. At this period it was lawful to employ children at 8 years of age, instead of at 9, which was the earliest age of children in the previous returns. In this year, 4,323 factories employed 33,624 children, a larger number than in 1838, but a smaller increase than the increase of other classes of hands.

The last return is for 1856, and it shows a considerable increase of the number of children in cotton factories, but still the number of children between 8 and 13 years of age, now employed for half-time in 4,657 factories, is less than the number of children, between 9 and 13 years of age, employed in 2,929 factories in 1835; or, comparing 1856 and 1835 (and making every allowance, in the comparison, for the various kinds of factories and of processes brought within the Factory Acts since 1835, such as weaving by power, &c., in which chiefly adults and young persons are employed), if the labour of the children working full time in 1835, were performed in factories in 1856, by children working half time, for which double the number would be required, instead only of the 44,385 children now attending school, there would be at least 120,000.

Silk factories have been excluded from the above statement, for the reasons I have explained; but if a comparison be made of them, similar and perhaps more striking results will follow.

In 1844, silk-throwing factories were exempted from the half-time system, and in that year the silk-throwing mills in the town of Derby gave employment to the following number of hands:—

Above 13 years of age	3265
Between 11 and 13 years of age	633
Between 8 and 11 years of age	431

all working full time, and none attending school.

In 1845, the youngest class, those between 8 and 11 years of age, were required to work half-time and to attend school:—the numbers were

Above 13 years of age	3466
Between 11 and 13 years of age	625
Between 8 and 11 years of age	128

The labour of the 431 children employed for full time in 1844, was not provided for in 1845 by the employment of double the number working half-time, for only 128 half-timers, less than one third, were then employed; nor was this deficiency caused by the introduction of new machinery. In 1850, the number of half-timers was reduced to 12, and although they had increased to 93 in 1856, the remainder of a large increase was confined to the oldest hands.

That these results were the direct effect of the application of the half-time system, cannot be doubted. The trouble of arranging relays or sets of children, the necessity of employing twice the number for the same work, and the difficulties with respect to wages, were serious impediments to a cheerful acceptance of the system; and when to these is superadded the responsibility attaching to the employer so long as he has one child upon his premises, the constant necessity of supervision over the school attendance of the children—a supervision over them not in the factory, but beyond its limits, and frequently almost beyond the reach of his control, it is not unnatural that the employment of half-timers has so much diminished; in fact they are rarely now employed unless the supply of older hands is limited, or the nature of the work is held to require smaller hands. If the effect of the half-time system had been to cause the attendance at school of the children whom its provisions banished from the factory, we should not regret that the labour of children in factories has been so much diminished; but the knowledge that such a vast number of children have been deprived of the educational benefits intended for them, is a matter of the deepest concern to all. An intelligent manufacturer of Glasgow, in a letter addressed to Lord John Russell, laments that in that city, containing 400,000 inhabitants, only 140 half-time children are attending school; and he thus describes the present condition of the children destined to become factory operatives when old enough:—

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* Reports of the Inspectors of Factories for the half-year ending October 31st, 1856.

"Twenty years' trial has left the factory population as uneducated as ever, and the children now, instead of the healthful discipline of the factory and the schools, are degraded to ragged idleness and stolid ignorance. Instead of giving them moderate labour with the addition of healthful teaching, children have been robbed of all employment, and turned over helpless and unprovided for to the tender teaching of the streets."

My colleague, Sir John Kincaid, who is Inspector of Prisons as well as Inspector of Factories for Scotland, and who may therefore speak with authority upon the uneducated classes, thus refers in his report for April last, to the educational condition of the factory population in Scotland:—

"As the question of education is at the present time attracting much attention, both in and out of Parliament, it may not be inopportune if I revert to some observations on that subject which I made in previous reports, arising out of inquiries which you directed me to make in regard to the employment of children in the houses of their parents. These observations will be seen by referring to my report of April 1850, p. 34; October 1850, p. 42; and in that for October 1852, p. 46.

"The educational condition of the children of the poorer classes in Scotland is in no respect improved since I then wrote; I still go into factories, and selecting at random the names of five or six children to be brought before me for examination, it is not unusual to find that only one or sometimes two of the number can either read or write.

"This lamentable state of ignorance is not caused by the want of schools, for there are, I believe, few districts in Scotland in which the children of the poor may not receive education at a mere nominal charge; but poverty and profligacy are alike instrumental in inducing parents, instead of sending their children to school, rather to send them prowling the streets, on the chance of picking up a few pence, honestly or dishonestly, as the case may be, to feed the wants or the vices of the parents.

"Such is the condition of a great number of the children of the poor in the manufacturing districts of Scotland, until they have arrived at the age of 13, when they become eligible for employment in the factories as 'young persons;' for, as I formerly showed, the educational clauses of the Factory Act, contrary to the benevolent intentions of its framers, have virtually excluded children under 13 years of age from employment in the Scotch factories, so that the class I have adverted to, having received no education prior to their entering the factories, have little chance of receiving any after, their weekly earnings being absorbed in the wants of their parents.

This is an enormous social evil, which, it appears to me, may be corrected by giving the parent a direct interest in the education of his child, by establishing an educational test as a qualification for employment."

The main object of parents is unfortunately to enjoy at the earliest possible period, full-time wages instead of half-time wages, and all kinds of artifices are employed to entitle a child to work full time. To obtain this it is necessary that the child should be certified by a surgeon to be in his opinion 13 years of age, and forgery and falsification of documents are not unfrequently employed for obtaining that expression of opinion. A very painful case was recently brought to my notice, in which a certificate of baptism had been altered so as to prove a child not really 12 to be 13. The surgeon had refused to give a full-time certificate to a boy in his opinion under 12; the boy afterwards produced a certificate of baptism proving his age to be 13, but upon examining the document carefully, the surgeon found that the year of the birth had been altered. He forwarded it to me, and from the investigation which was made with the view of punishing the person who had altered the certificate, it appeared that the boy was an orphan, that he could read and write well, and that he lived with an aunt, who had refused to keep him any longer unless he obtained work for full time. Not being able to do so, he himself altered the certificate and presented it to the surgeon.

Independently of the direct interference with labour of the half-time system, improvements in machinery, which meet us in every kind of factory, are nearly all substitutes for manual labour; the fewer the hands in a factory, the more easily, the more economically, can its operations be conducted, and the younger hands are those whose labour is most frequently dispensed with. I have been assured in woollen factories that the "Piecing Machine," the only operation of which is to join or splice the rollers of wool, usually performed by school children, has been adopted expressly to avoid the employment of them. The use of this machine and the condenser, also dispensing with juvenile labour, is extending very rapidly, thus throwing many out of work who were physically capable of performing it, and depriving them of certain educational advantages which they could not possess as full timers.

Such having been the effect of the half-time system upon the number of children employed in factories, it is desirable, in the next place, to consider what has been obtained by half-time attendance at school.

In the minds of many parents, and I am bound also to add of too many factory occupiers, it is considered sufficient if the schoolmaster's certificate attest the attendance of a child at school, merely so as to satisfy the law. Be the schoolmaster who he may, provided he testify to the daily three hours' atttendance at school, they are satisfied—thus the law teaches them. The law requires the child to be *in* school from 9 to 12, or from 2 to 5; that therefore is all that is deemed necessary; the quality of the school is no part of the compact. The parents select the school (and the right to do so is properly theirs,) but having done what the law requires, are they really so much to blame? My colleague Mr. Howell, in his last report, pp. 54, 55, refers to this subject in the following terms:—

"The parents of the factory children, in complying with those provisions of the Factory Act which enjoin daily attendance at some school, are from poverty necessarily guided in their selection of the school rather by its cheapness than by its merits, in order that as small a sum as possible may be withdrawn from the child's weekly contribution to the common stock for the maintenance of the family. And where, as in the Factory Act, he certificate is so ill contrived for the attainment of its professed object—the furtherance of education—as merely to attest the barren fact that a certain number of hours have been spent in a schoolroom, without any guarantee that something useful has been learned, or that some definite progress has been made in gaining useful knowledge, it is of paramount importance that good schools should be provided, and made accessible at as cheap a rate as any others into which children of the poorest people are admitted; otherwise the parents will always choose the cheap private day or dame's schools in preference to those educational establishments where really useful instruction is to be obtained, but at a higher price.

The remedy for this defect would seem to be to enable public day schools, by a sufficient endowment, to give better instruction at as cheap a rate as that at which these dames and private schools are opened to factory children, or to require in every case a certificate of proficiency from time to time as a test of something having been learnt, instead of a mere certificate of so many hours having been spent in a schoolroom."

The attendance at school, when observed, is only for half-time; while the regular hours of the school are six per day, and an energetic and intelligent master has an arduous task to make those six hours comprise all that he could wish, what small chance has the half-day scholar of reaping real advantages from the confined opportunities of a half-time system. In the case of girls, for instance, attending school three hours per day, they must be taught to knit, sew, and to mend clothes; one hour, frequently one hour and a-half, is devoted each day to instruction in the use of the needle; the remaining hour and a-half or two hours to general instruction; what can they learn in that time? how much of the teacher's time can be bestowed upon each individual? Again, it is most important to remember, that to the ordinary day scholar his school is his only occupation; to the factory child it is a part only of his occupation, and secondary to his employment.

The school attendance, moreover, is not continuous; it depends upon the regular employment of the child. If the child does not work for a week, it does not go to school; and in general the child destined for factory labour does not go to school until compelled by its entrance into a factory. If the school attendance endured from the age of 8 years until 13, when school attendance is no longer obligatory, the results of a half-time system would be doubtless satisfactory, but it will be necessary to ascertain the duration of attendance at school, and the real value of that attendance as exhibited in the progress of the children.

The very short time during which the children of the labouring classes remain at school is the greatest existing impediment to be removed; it clogs the best efforts of the school teacher; it retards the progress of the child, and produces failure where we in vain seek success, and its real proportions cannot be too widely known.

The reports of the Inspectors of Schools enable us to appreciate this question as its importance deserves. In them will be found most valuable statements, showing the ages and attainments of school children, and the length of their stay in school. The proportions of the latter vary in different localities; but in Lancashire and Yorkshire it appears that about one half of the children (46 per cent.) leave school before the expiration of one year.

In my report for April, 1853, I gave the results of some inquiries into this subject among the schools of my district, at which factory children attend. The number of schools is about 310. Of these I rejected 126, viz:—those which were of a marked inferior character, and those which were attended by so few factory children as to afford no comparison, and I obtained from 184, being National-schools, Church, British and Foreign, Dissenting and Factory-schools, being the best in my district, returns shewing the duration of attendance, and the attainments of the children.

The number of children then attending these schools, (April, 1853) amounted to 14,705 half-timers employed in factories, and 15,125 children not employed in factories attending school the whole day.*

The duration of attendance in these schools is very similar to the results obtained by the Inspectors of Schools, and, comparing the two classes of scholars, appeared to be as follows:

In School.	Factory children.	Whole day Scholars.
	Per cent.	Per cent.
Under 6 months	37.4	33.5
1 year and above 6 months	24.2	23.9
2 years and above 1 year	14.6	16.5
Above 2 years	23.8	26.1

This is a somewhat important statement, because it is evident that the factory half-time system has not had the effect of prolonging the duration of school attendance.

In the same report I gave the best results I could obtain as to the attainments of the factory half-time children then attending school, as compared with their fellow scholars, attending school all day; and I procured statements of the actual occupation of the children in school, of which the following is an analysis:—

	Factory children.	Whole day children.
	Per cent.	Per cent.
Learning to read only	10.7	26.5
Learning to read and write only	21.3	20.9
Learning to read and write, and the first four rules of simple arithmetic	41.7	25.7
Learning grammar, geography, history, and the higher rules of arithmetic	26.3	26.9

This statement is decidedly favourable to the factory children; but then none of the factory children are under 8 years of age, while the other children are from 4 years and upwards; but if such of the children as are under 8 years of age are excluded, the comparison, from the best data I could obtain, appeared to be as follows:—

	Factory children.	Whole day children.
	Per cent.	Per cent.
Learning to read only	10.7	—
Learning to read and write only	21.3	—
Learning to read and write, and the first four rules of simple arithmetic	41.7	48.9
Learning grammar, &c., and higher rules of arithmetic	26.3	51.1

This statement discloses a discouraging picture of the average attainments of factory half-timers, compared with whole-day children of the same age and in the same schools; both classes remain in school about the same time; but the factory half-timers only spend, at the utmost, half of that time in school.

The value of regular attendance at school is shown in the attainments of the children attending five of the factory schools in my district; *i.e.*, schools attached to factories, supported by the occupiers of the factories for the education of the half-time children employed by them, in which the vacancies in the factory are filled by draughting boys from the school. The attainments of the children, who have thus attended school all day prior to working in the factory, are as follows:—

	Per cent.		Per cent.
Learning to read only	1.2	instead of	10.7
Learning to read and write only	11.0	„	21.3
Learning to read and write, and the four first rules of simple arithmetic	47.0	„	41.7
Learning grammar, &c., and higher rules of arithmetic	40.8	„	26.3

This is, perhaps, what the abstract principle of the half-time system was expected to produce, but having failed to secure regular attendance at school from the age of 8 to 13 years, it has failed in its chief recommendation as a system of education.

But factory legislation, of which the half-time system is a part, has been of the most essential service to the labouring classes. It at once put a stop to the growth of that unnatural system wherein the employment of the wife and mother superseded that of the husband and father; the employment of the child, that of the adult. The adult man, the duration of whose labour is not directly lessened by the factory acts, does, nevertheless, work for shorter hours, as his labour depends upon that of women and children which cannot be protracted. The mother is no longer detained from her home, her children, her domestic duties, after 6 o'clock in the evening; she has ample time for meals, and on Saturday her work ceases at 2 o'clock in the afternoon. Young men and women enjoy similar advantages, and the Institutions in union with this Society can probably bear testimony that the time after 6 o'clock in the evening is well spent.

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* The above number of 14,705 half-time children attending only 184 of the schools in my district, was very little less than one half of the whole number of children employed in the factories of the United Kingdom.

I may mention, as an instance of the value of the relief afforded by the factory acts to this class of workers, the following circumstance which came under my own observation:—

A factory was recently established at a seaport in my district where none had previously existed. At my first visit I found the hands, all of whom, except 3 or 4, were girls and young women, working in one large room, noisy, inattentive, and impudent. They were, in fact, in the words of the manager "a sad lot." But at subsequent visits I found the aspect of the place changed; noise had ceased, they were all attentive to their work, and the manager told me he did not then wish to have a better set of hands, many of whom had been with him from the commencement. In explanation of the change, he told me he had established an evening school 5 nights in the week, and that he and his wife taught all who chose to attend, reading, writing, and accounts, at a charge of one penny per week, the occupier of the factory finding the lighting and firing in the winter months. The attendance varied from 50 to 70 per night, and the excellent manager pointed out to me several women who were ignorant of their letters, but who could now read and write.

Children of tender years have been benefited in a greater degree. Factory legislation has prevented the excessive labour of the child; it can no longer be employed from early morn to dusky eve, hour by hour and side by side with the adult man; its strength is not overtasked, its unset bones are not crippled, nor its constitution diseased by exhaustion and protracted employment. Its labour must be moderate; it must pass some hours daily in school; and, being so obliged to attend school, the school fee is provided for in the wages it earns. Those children who do work in factories have thus been brought to school, who, without these laws would never have entered a school-room.

Two great objects were proposed by the benevolent authors of factory legislation. The physical and the moral improvements of factory hands. Their physical improvement is now well established; sufficient, yet moderate labour has produced its natural results. The present generation of factory hands are free from the diseases and ills which afflicted their predecessors. It is rare to see what are commonly called "factory cripples;" men whose strength in youth from excessive labour was unable to support the fatigue of their employment, whose spines became curved, whose legs gave way beneath the weight of their attenuated frames. Upon inquiring of one whom I recently met in a manufacturing town, to what he attributed his deformity, he replied, "When a boy I was as straight as an arrow, but 15 hours a day in a factory, before you gentlemen came to look after us, made me what I am." The daily labour of that man's child now never can exceed six hours and a half.

The actual effect upon the moral improvement of adults and adolescents could not be so immediate. Their bodies required rest, which was given upon the passing of the statute, but their minds required occupation for which they could only be gradually adapted. Nevertheless, the improvements in social habits, the increasing desire for instruction, and the appreciation among employers of those as servants who distinguish themselves by attainments as well as industry, so happily called into action by the exertions of the Council of this Society, warrant the confident hope that time and opportunity have not been thrown away.

To the moderate hours of labour and necessary attendance at school of children under 13 years of age, may doubtless be traced gradual improvements in character and conduct; from them other benefits have flown and will yet be brought to light. Many children have turned their half-time school attendance to good account; and have taken a respectable position among the whole day scholars. Some have gained pupil teacherships, and and have obtained advancement in consequence of attainments and conduct; and it is most gratifying that factory labour, as at present regulated, does not prevent the industrious and intelligent child from obtaining a reward commensurate with its exertions. But all children have not the like application; all parents have not the like desire to foster the diligence of their children, the same pride in their successful attainment of knowledge. The instances to which I have referred are not the rule of the half-time system, but the exception, proofs of what can be done under an imperfect system. A retrospective view of the half-time system of education must convince every one that it was excellent as a commencement; that it was at its institution a great step in the right direction, and it is at the present time a great boon to a portion, though comparatively a small portion, of the labouring classes. Fully alive to the advantages which flow from it, I cannot, however, satisfy myself that, as an educational scheme, it would be adapted for general and indiscriminate extension.

It is not a system simply for promoting education; it has a double purpose; it is a part of a general scheme for the prevention of the excessive labour of children, young persons, and women. If it be shown that excessive labour prevails in trades not under the Factory Acts,—as, for instance, in lace factories—let the labour of children in those trades be restricted to half-time, and let them be sent to school as if employed in factories, but if no such excessive labour be alleged, and if the sole object proposed be to secure to children of tender years opportunities for instruction, then should the regulations be framed for that specific purpose, not involving other considerations, which will militate against the full and satisfactory development of the enactments.

The authors of factory legislation having in view the twofold object of permitting moderate labour, and of providing for instruction in certain trades, where certain physical evils were caused by excessive labour, necessarily adopted a combination of the two, but if they had been required to propose a scheme of education for universal application, I think it may be reasonably questioned whether they would have recommended exactly the same scheme.

It appears, as far as we are able to judge, that, for some years to come, the labour of children will be indispensable to the employer on account of its cheapness, and it appears no less probable, that the wages of their labour will be indispensable to parents; those who pay and those who receive being both agreed, it is unlikely that their compact will be easily disturbed. We may all desire a golden age, when every child shall remain at school until the age of 14 years, and shall not depart therefrom until some years' training shall have produced a result; the realisation of such a dream is at the present moment impossible, but we may nevertheless attempt that which is practicable, which will interfere as little as possible with the relations of employer and employed, which will offend few prejudices, and which will prepare the way for improvements which the growth of time and the ripening of men's minds will fit them to appreciate and to accept.

If the legislature is to be called upon to place other trades under restrictions—and if other trades why should there be any exception—it is certainly of the gravest importance that the restrictions should be productive of the largest amount of good, that those who are placed under pains and penalties should have the consolation of knowing that a commensurate good follows from the restrictions, and that the restrictions should not be opposed, even in imagination, to the interests of either employer or employed.

To the government of this country belongs the duty of enunciating principles; to the people themselves, under such supervision only as may be absolutely necessary, the duty of carrying those principles into effect. It would be perfectly legitimate for the legislature to enact that every child shall receive instruction, but it would be indefensible if they were to prescribe the schools in which such instruction must be communicated, and the manuals which must be used, and I apprehend that the legislature is actually called upon by all moral and social considerations to see to the instruction of the children of those who will not see to it themselves, upon the same principle upon which the legislature has already interfered in the case of children who, from the neglect of their parents, have lapsed into crime, by requiring such parents to maintain their children during a lengthened reformatory incarceration for the offences to be traced to the neglect of parental duties. The analogous course would appear to be, to deprive parents of their present right to the wages of children of tender years, by declaring that the employment of children under 12 years of age should be illegal, unless they produced an educational certificate.

As the legislature has already provided safeguards against the excessive labour of children in certain employments, wherein their physical development would suffer but for that intervention, it does not appear to be necessary to extend the provisions of the Factory Acts to other employments, unless a reduction of the hours of labour be specially determined upon. There is one class of employment in which the necessity of interference with labour has been clearly established, viz., Lace Factories, where the most disastrous moral results are the effect of unrestricted labour; but having regard now to the question of education generally, I would venture to propose:—

That no child under the age of 12 years should be employed as an apprentice, or for hire, or continuously in any other manner (except children whose school attendance is regulated by the Factory Acts), unless a certificate be produced to the person employing the child, certifying that he has attended school, and that he can read the Bible fluently, can write a fair text-hand, and can work sums in the four first rules of simple arithmetic. That the certificate should be signed by a schoolmaster, whose signature should be attested by a clergyman or magistrate. That no certificate should be valid unless upon an engraved form issued from the Stamp-office, bearing a sixpenny stamp, and sold at the price of the stamp by all persons licensed to sell stamps. That there should be a penalty upon the employer and upon the parent of a child employed without a certificate, and a penalty for forgery or fabrication of certificates.

The principle of requiring instruction to precede employment would, I think, be much less difficult of application, and much less exacting to employers, much less obnoxious to the prejudices of parents, as well as much less opposed to their interests than a half-time system, while it would be, I believe, much more efficient in reality.

The employer would have but one act to perform, to require the production of a certificate, to examine it, and satisfy himself of its trustworthiness, and his responsibility would be at an end. He would not have to employ two hands for one; to re-arrange wages, nor would he be liable to penalties day by day for the omission of children to attend school. No daily vigilance would be necessary to see that the children have attended school, nor weekly examination of certificates.

However much we may lament the indifference which the labouring classes exhibit to the education of their children, and however much we may condemn their prejudices, we cannot ignore the existence of both, nor the difficulty of eradicating them; which, though we may be unable to disperse, it might still perhaps be possible so to regulate, as to make that which is unyielding and rigid, pliant and bending to our will. The labouring man does not as yet appreciate the value of education for his child. He looks to his child earning wages. If education were indispensable to fit children for employment, how many would now be at school, instead of idling in the public thoroughfares.

Under the half-time system the parent does not send his child to school, because he waits until his employment in a factory shall provide for the school fee, and he only sends him to school then because attendance at school is imperative. Here there is an indirect inducement to the parent to keep his children from school, or to prove his child to be of that age when school attendance is no longer obligatory. It is always an object with the parent to obtain the admission of his child to a factory as a full-timer, because he then receives full-time wages instead of half-time wages; thus the parent has no solid advantage in sending his child to school; he does so, because without it he cannot receive the child's weekly pittance. But if it were made to his interest to send his child to school at an early age, to see that his child learnt something at school—if he perceived that the children who had been to school were preferred to those who were ignorant—if the receipt of wages depended upon previous instruction, if full-time wages were always to be obtained—if, in fact, it were made a question of wages, I doubt not that a very different feeling from that which now exists would animate the labouring classes. Under such a system there would be little interference with the supply of labour, or with the rate of wages, although the commencement to labour of some few children might possibly be postponed for a short period; and there being no responsibility constantly hanging over the head of the parent, his prejudices against education would gradually yield to conviction, and while sending his children to school, he would be preparing a future supply of juvenile labourers.

If a parent object *now* to the half-time wages of his child in a factory, he has the option of obtaining for it work elsewhere for full time, where full-time employment has not been shown to be injurious, but if a half-time system were universal, children who might be refused work on account of their being half-timers, or whose parents might object to half-time wages, would be deprived of work, of wages, and of instruction.

The first objection that may be urged against the principle which I have ventured to propose, will be the restriction of the certificate to children under 12 years of age. It will be contended, and with great truth, that previous to that age the merest rudiments are learnt, and that it is after the age of 12 that the real value of instruction is felt, and that all our efforts ought to be directed to retain children at school after that age. To the importance of such an effort I fully subscribe; but in proposing that the legislature should interfere to *compel children* to attend school, care must be taken that compulsion should be exercised in those directions, and for those objects alone, where compulsion would be justifiable. If the legislature were dealing, as in the case of factory operatives, with the physical condition of wives, mothers, and children, their interference is justifiable to prevent the deterioration, the disease and defective development of a class; and the reduction of the hours of labour is the direct means of prevention; but it may be doubted, whether an obstacle would be justifiable to a youth above 12 years of age gaining a livelihood, because the parent had been unmindful of his duties, whereby innocence would be punished, and the impunity of the guilty be confirmed. Restrictions, moreover, should be confined to those who require laws to force them to do right. Those who keep their children at school until and after the age of 12 years, require and deserve no interference by the legislature, which should be limited to those conditions in which parents refuse or neglect to send their children to school in their early youth.

In fixing the age up to which certificates of education should be required—or, in other words—the age during which obstacles should be interposed to the labour of children, regard must be had to the requirements of trade and to the condition of parents. It is truly remarked by the Rev. F. Watkins, Inspector of Schools for Yorkshire, in his report for 1855, p. 268:—

"With large allowance, therefore, for the difference of circumstances, I cannot think that the working-man makes as much sacrifice for his child's education as his more affluent brother does." Admitting that the working-man is able to spare the few pence per week necessary for his child's education, the question is, how shall he be induced to spend those few pence for that purpose? At present the parent has the advantage of his child's earnings; can he be expected, if he be deprived of them, to provide with a good grace for the school-fee out of his diminished earning? It appears from the Reports of the Inspectors of Schools, that about 70 per cent. of the children attending schools under inspection, leave school at 10 years of age. Mr. Watkins reports, that in Yorkshire, 79 per cent. of the children in schools are under 10 years of age. It must, therefore, be beyond doubt, that the children whose labour is required by their parents, have left school long before the age of 12 years. To deprive parents absolutely of their labour before that age would be a direct interference with the labour of those children, and those children especially, whose wages are necessary additions to the family earnings. To interdict juvenile labour would be to force employers to raise the rate of wages; an object desirable enough in one point of view, but an object which the legislature would hesitate to sanction by a direct and positive injunction. The necessity of a certificate, or rather the ability to read, to write, and work sums in the four first rules of simple arithmetic, would not be in itself a veto upon the employment of children of 10 years of age; children of that age, or at any rate children of 11 years of age, who had attended school regularly, would, unquestionably, be entitled to the certificate.

In considering the question of the age, it will be well to refer to the regulations of those foreign countries in which the education of the people has been enforced by the government, because in a matter of detail of this nature their example should have some weight, and because, having the power to make arbitrary laws, to frame those laws so as to ensure the object proposed, and having the desire to secure to the people a sound education, those governments have, doubtless, required the attendance of children at school, for such a duration of time as they have satisfied themselves to be sufficient and necessary.

In Austria the obligation to attend school ceases at 12 years of age.

In Prussia, Saxony, Bavaria, and Wirtemberg, the laws require the attendance of children at school until they have attained the age of 14 years; but actual acquirements are, notwithstanding the general enactments of the laws, preferred to mere attendance at school, and two years' attendance at school is dispensed with in the case of those children who obtain a certificate from their schoolmaster and clergyman, and who are thus released from their school obligations at the age of 12 years.

I have already argued that laws enforcing education should be confined to *children*. Young persons, able to read and write and to work sums, ought to be students in a system purely voluntary. The various Mechanics' and other local Institutions are the proper spheres of study for the youth of the labouring classes. No effort should be withheld, and very much is now doing, especially under the enlightened support of this Society, to promote this voluntary pursuit of knowledge; to induce young men to improve the scanty instruction to which they may have been unavoidably restricted at school. If in childhood they are taught regularity, subjection to discipline, and the mere rudiments which are now proposed, they would be fit to receive and to hold the higher instruction which in later years may be obtained during their leisure hours.

But the whole value of a certificate system would depend upon its practicability. If it could be proved that trustworthy certificates would be obtained; that there would be no special disfranchisement of any class of schools; that the state would only interfere to execute the law; that parents would have free choice o the school, then, perhaps, some serious objections to the compulsory system would be answered; and in proposing a schoolmaster's certificate duly authenticated as a qualification for employment, the scheme is not submitted as one that is free from objection, as a scheme which may be considered fully adequate to meet the real existing wants, but as a commencement, which may lead to the development of a plan better adapted for general employments than is the special factory half-time system of education, a plan more suited to the requirements of the age, and offering more prospect of real and substantial advantage to children.

The trustworthiness of a certificate depends upon the character of the granter, the value of it upon his capacity, and it may be urged that schoolmasters are hardly persons to be entrusted indiscriminately with the granting of certificates. But the principle has been sanctioned by the government, that approved schoolmasters are the persons to whom such power may be confided. Under the existing regulations of the Committee of Privy Council on Education, schoolmasters may grant to children after a public examination, certificates upon forms supplied and counter-signed by the Inspector of Schools. In the several Coal Mine Prize Associations, the certificates are similarly granted by the schoolmasters, and in proposing that schoolmasters of schools not under inspection may be empowered to grant educational certificates, it appears to be better to deal with the means at hand, to accept what is in existence, and to make the best of it, to adapt the scheme to the present state of things, than to make it dependent upon a new state of things which has to be expressly created, and to defer, perhaps indefinitely, the immense amount of good which might accrue from the present means.

The proposition that has been made, that local examiners should hold examinations at frequent intervals for the purpose of granting Educational certificates, would be the most efficient mode of working a certificate system, but it must not be forgotten how elementary is the knowledge that would be required, at any rate at first, of candidates for employment; and how needless, on that account, would be the appointment of special examiners to grant certificates of attainments so slight. For these reasons it would be, perhaps, expedient to bear for a time with the present schoolmasters, (the deficiences of many of whom I acknowledge and lament) inasmuch as the more the necessity of a child learning something, and learning it well, becomes evident, the more rapidly will the schoolmaster and the dame, incapable of imparting the instruction that is required, pass away, and their places be supplied by teachers qualified to grant certificates of far higher attainments.

The question yet remains, in what manner such a scheme would be administered so that it should be generally observed. For the consideration of this question, employments may be divided into three classes:—Establishments already under restrictions; Establishments not under restrictions, but wherein juvenile labour is required; All other employments of children.

There are three kinds of employment of children now under restriction—factories, printworks, mines; and the officers already appointed to carry out the provisions of the several acts relating to them, would respectively be the proper officers to superintend the application in them of any general regulations respecting education.

With respect to the employment of children in mines, Mr. Tremenheere, the inspector of mines, has expressed the strongest opinion of the impracticability of a half-time system, and he advocates a system whereby the employment of children in mines shall be illegal, except upon the production of a certificate periodically, proving them to have previously attended school for a certain number of hours, or, in other words, he advocates the printwork system of education. If this system required the production of a certificate of ability, instead of a certificate of so many hours passed in school at irregular intervals, sometimes upon "Saint Monday," sometimes in the morning, sometimes in the afternoon, it would be an improvement upon the half-time system, but as far as the experience of the printwork system may be relied on, it is a system of the smallest value.

With respect to the employment of children in factories, if, as many persons believe, and as I also am of opinion myself, a child of 12 is capable of performing the work of a child of 13 without injury to health, or detriment to its physical development, it would appear to be a measure of justice to manufacturers to permit the employment of children of 12 years of age for full-time upon the production of an educational certificate. My colleague, Sir John Kincaid, who for some years has urged upon Parliament with much force the substitution of a certificate system instead of the half-time system in factories, has also expressed his opinion, in which he is confirmed by others, that a child of 11 years is fully equal to perform the labour now performed by a young person of 13; but there are good grounds for believing, notwithstanding the precautions contained in the Factory Acts for preventing the employment of children for full-time until the age of 13, that there are, at the present moment, many children employed for full-time in factories who are not more than 12 years of age.

The proof of the attainment of 13 years of age for factory labour, is not a certificate of birth, but the certificate of a surgeon that he is of opinion that the child has the appearance of that age, and is free from disease, &c., which would render him unfit for factory labour—a disqualification, however, not of frequent occurrence.

Although I have great respect for many of the certifying surgeons of my district as men of undoubted ability and honour, and who perform the duties of their office with zeal and fidelity, yet I cannot believe, indeed I know from experience, that "an opinion of the appearance of a child" is not so certain a proof of age as a certificate of birth; and in our joint report for the half-year ending 31st October, 1853, my three colleagues and myself drew the attention of Parliament to the very unsatisfactory condition of this part of the machinery of the Factory Acts.

I do not suppose that the certifying surgeons advisedly pronounce what they know to be an erroneous judgment; but there are many errors of judgment; and the extreme pressure of the parents, their assertions and false statements blind the surgeon to the real appearance of the child. In fact, the certifying surgeon has frequently, and especially when trade is brisk, a very difficult task, requiring great firmness and discretion.

If the certificate system were extended to factories, there ought to be no interference with the half-time system, except between the ages of 12 and 13. Between the ages of 8 and 12, children must still be restricted to half-time, attending school daily; but on the completion of that age, and the production of a certificate, they would be entitled to full-time employment. If, however, children should be unable to produce an educational certificate at the age of 12 years, they would be required to continue upon half-time, and to attend school until the age of 13, when they are entitled by the Factory Acts to work for full-time.

The next class of employment are those trades in which a large number of children are employed.

The institution of some Inspection would here be necessary. In many establishments an inspection would be merely nominal, because the principals, as a measure of their own, in their earnestness for the well-being of their hands, would not only do all that the law might enjoin, but, like some occupiers of factories to whom I could refer, go far beyond the requirements of an Act of Parliament. But in others, especially upon the introduction of a new law, some inspection would be requisite, both to explain the details of the law, to remove any anticipated difficulties in its application, and, if opposed, to enforce its adoption.

The last class of employment comprises all other occupations—mechanical, commercial, and agricultural.

In this class, I conceive a special inspection might not be requisite. There would be, in fact, a supervision pervading, constant and non-official. In rural districts where all the residents are known to each other, there would be a constant check upon the premature employment of children. The rector, the curate, the dissenting minister, the Roman Catholic priest, knowing respectively the members of their communion, the visitors of the poor, would, by their presence, be an efficient check. The village schoolmaster may readily know, and in effect does know, what becomes of his pupils. Thus, there would be so much general attention drawn to the subject, that it would be difficult to evade the law; the employer of an uneducated child would be the object of as much distrust as the parent.

The same means would exist in towns, but in a somewhat less effective degree, and to make up for what these agents could not accomplish, the Sunday school teachers, district visitors, and other persons having like opportunities, would exercise a salutary and I believe, a very effective moral control, over the irregular employment of children. All this supervision, this control would be of moral force only, and I believe, as the prohibition would be one of universal application, not of a practice which existed in a certain trade, unknown to the public out of that trade, that if these persons exerted their just influence in their several spheres, a special inspection would be uncalled for, and the infliction of a penalty be rarely necessary.

But the requirement of an educational certificate was proposed to Parliament in 1841, in a bill to regulate labour in silk factories. In that year, a bill was introduced into the House of Commons, by Mr. Fox Maule (now Lord Panmure,) and the late Mr. Shiel, on the part of the government, in which it was proposed that no child under 13 years of age should be employed unless he was able to read the New Testament, and that every child under 13 should be examined once a year by a clergyman; and if he did not certify that satisfactory progress had been made since the last examination, the child could not be employed. And further, that no person under 14 years of age should be employed for more than 10 hours a-day, unless he could read fluently any part of the Holy Scriptures, could write a fair copy in large and small hand, and understood the first four rules of simple arithmetic, and could produce a certificate of such ability.

This bill was withdrawn by the government, together with many others, prior to the dissolution of Parliament; in the reassembling of which, Sir Robert Peel was placed in power, and his government did not adopt this bill of their predecessors.

It may yet be objected, that to require a certificate from every child would be to inflict a serious hardship upon those parents who are really too poor to pay the school-fee. The legislature has already provided for the training of children whose youth has been neglected by their parents, and who have become criminals; it has provided for the instruction of children, not criminals, but from necessity inmates of workhouses; and it has empowered boards of guardians to send to school the children of persons receiving out-door relief; and having thus provided for the children of the least deserving classes, can the legislature refuse much longer to make some provision for the instruction of those children whose parents, not being criminals, nor inmates of workhouses, nor deserters of their children, nor burdens upon their richer brethren, are, nevertheless, unable from poverty to pay school fees and to maintain their children altogether without assistance.

In all the higher grades of employment, guarantees must be produced vouching for the character and ability of the persons employed: in many minor occupations the employers require a satisfactory reference, and through the instrumentality of this society a great impulse has been given to the value of a certificate; and at your invitation all the principal bankers, merchants, traders and manufacturers have declared their readiness to give preference to persons holding certificates granted by the examiners of this Society; and I venture to hope that it is not too much to expect, while they require guarantees from adults, and express a willingness to attach value to certificates of attainments, that the employers of juvenile labour will also give a preference to children, who, in their humble way, present certificates of their honest exertions, and thus will stimulate and reward the sacrifices of the industrious poor.

DISCUSSION.

Mr. F. S. Powell, having alluded to a report by Mr. Redgrave in 1855 upon the operation of the factory system in France, begged to inquire how far the regulations of the government with regard to the restriction of the hours of labour, &c., in factories had been carried into effect. It was stated in that report, that owing to various local circumstances, those regulations were only partially carried out. He wished to inquire, generally, with regard to the working of the factory systems in Belgium, Germany, and America, and particularly with regard to education in those countries in connection with the factory system.

Mr. Redgrave replied, that in Prussia, the half-time system existed nominally, but not in practice, in consequence of the objection to it on the part of the manufacturers. The statute was passed requiring the appointment of inspectors of factories, but none were appointed, and the law remained in abeyance. That law restricted adult labour in factories to 12 hours per day, and short hours for children who were required to attend school. The same might be remarked with regard to France, with the exception of the department of Le Nord; at Lille the regulations were carried into effect rigidly, but he believed in no other part of France.

Mr. Henry Cole, C.B., said he would take this opportunity of addressing a few words on the general principle of education, and governmental interference with it, rather than attempt to go into the details of the paper that had been brought before them. They might collect from the paper that there was a great deal of caprice about the factory system. It seemed to him that the Government, having found out the means of catching large numbers of people concentrated in factories, had applied to them exclusively rules which, if correct, ought to be applied to the community at large. There appeared to be an anomaly in this, but it was the practice in this country to go on little by little. He ventured to think the principle was correct that the Government should endeavour to see that the people were educated. He thought that was the first point they had to discuss. He ventured, at an agricultural meeting held last autumn, to remark, that he thought what was good for the factory people—if good—was good for the agricultural people too; but the farmers said, "they would not stand it." His remark upon that was, that if the proprietors of factories, who were a very powerful body—if they submitted to the compulsory education of their workpeople, probably the farmers might learn to bear the same infliction. He was not an advocate for Government interference where it could be done without; and where people could act for themselves he thought it was best for the Government to abstain from interference. It might be imagined that because he was connected with the educational department, he had some prejudices upon the subject. He desired to place upon the records of this Society the opinions of one of the soundest writers on Political Economy (and when he mentioned his name he need not say that he was no advocate for despotic interference), he referred to John Stuart Mill, the most eminent political writer in this country, and probably in Europe, at the present time. He had glanced over his work in order to read to them in his own words, which would better show, than any he (Mr. Cole) could employ, the opinions which the author held in reference to the interference of Government in this question of education:—

> "But there are other things, of the worth of which the demand of the market is by no means a test; things of which the utility does not consist in ministering to inclinations, nor in serving the daily uses of life, and the want of which is least felt where the need is greatest. This is peculiarly true of those things which are chiefly useful as tending to raise the character of human beings. The uncultivated cannot be competent judges of cultivation. Those who most need to be made wiser and better usually desire it least, and if they desired it, would be incapable of finding the way to it by their own lights. It will continually happen, on the voluntary system, that the end not being desired, the means will not be provided at all, or that the persons requiring improvement having an imperfect or altogether erroneous conception of what they want, the supply called forth by the demand of the market will be anything but what is really required. Now, any well-intentioned and tolerably civilised Government may think without presumption that it does or ought to possess a degree of cultivation above the average of the community which it rules, and that it should therefore be capable of offering better education and better instruction to the people than the greater number of them would spontaneously demand. Education, therefore, is one of those things which it is admissible in principle that a government should provide for the people. The case is one to which the reasons of the non-interference principle do not necessarily or universally extend.
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> "With regard to elementary education, the exception to ordinary rules may, I conceive, justifiably be carried much further. There are certain primary elements and means of knowledge which it is in the highest degree desirable that all human beings born in the community should acquire during childhood.*

We might take it for granted that they were all agreed that everybody ought to be able to read and write. At the same time, he did not think mere reading and writing would make human beings all that they ought to be. It only helped them a little way on. He would not theorise upon fine-drawn schemes of education of the affections, and those imperceptible matters which a child acquired under the influence of home education; but he might safely aver, that everybody ought to read and write, and acquiescing in that proposition, he would ask them not to shrink from taking those means that would help the people to read and write.

> "If their parents, or those on whom they depend, have the power of obtaining for them this instruction, and fail to do it, they commit a double breach of duty, towards the children themselves, and towards the members of the community generally, who are all liable to suffer seriously from the consequences of ignorance and want of education in their fellow-citizens. It is, therefore, an allowable exercise of the powers of government to impose on parents the legal obligation of giving elementary instruction to children. This, however, cannot fairly be done without taking measures to ensure that such instruction shall be always accessible to them, either gratuitously or at a trifling expense.
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> "It may, indeed, be objected that the education of children is one of those expenses which parents, even of the labouring class, ought to defray; that it is desirable that they should feel it incumbent on them to provide, by their own means, for the fulfilment of their duties, and that by giving education at the cost of others, just as much as by giving subsistence, the standard of necessary wages is proportionally lowered, and the

> springs of exertion and self-restraint are so much relaxed. This argument could, at best, be only valid if the question were that of substituting a public provision for what individuals would otherwise do for themselves, if all parents in the labouring class recognized and practised the duty of giving instruction to their children at their own expense. But, inasmuch as parents do not practice this duty, and do not include education among those necessary expenses which their wages must provide for, therefore, the general rate of wages is not high enough to bear those expenses, and they must be borne from some other source. And this is not one of the cases in which the tender of help perpetuates the state of things which renders help necessary. Instruction, when it is really such, does not enervate, but strengthens as well as enlarges the active faculties. In whatever manner acquired, its effect on the mind is favourable to the spirit of independence; and when unless had gratuitously it would not be had at all, help in this form has the opposite tendency to that which in so many other cases makes it objectionable—it is help towards doing without help."

If they looked at the principle of the Poor Law, they found that the more worthless people were helped, the less they would help themselves; but the more they helped a child, the more independent they made him in after years. Therefore, those who talked in high-sounding phrases about liberty, could only prove the worth of their assertions by being prepared to educate the children.

> "In England, and most European countries, elementary instruction cannot be paid for at its full cost, from the common wages of unskilled labour, and it would not if it could."

He did not agree with the author in this. He believed if they could train up the labouring population to forego their useless pot of beer, the money saved would be employed in the education of their children. In his experience of country life, he had often seen the agricultural labourer forego his 2d. per week from his beer in order to educate his children.

> "The alternative therefore is not between government and private speculation, but between a government provision and voluntary charity; between interference by government, and interference by associations of individuals, subscribing their own money for the purpose, like the two great School Societies. It is, of course not desirable that anything should be done by funds derived from compulsory taxation which is already sufficiently well done by individual liberality. How far this is the case with school instruction, is, in each particular instance, a question of fact. The education provided in this country on the voluntary principle has of late been so much discussed, that it is needless in this place to criticise it minutely, and I shall merely express my conviction, that even in quantity it is, and is likely to remain, altogether insufficient, while in quality, though with some slight tendency to improvement, it is never good except by some rare accident, and generally so bad as to be little more than nominal."

They knew that schools had very considerably improved during the last twenty years; but if they went into many schools—some of which he could mention—schools well inspected, well endowed, and getting government grants, and receiving substantial aid from the benevolent in the district—if they went into such schools and put a question to the children out of the rote taught by their books, they were puzzled to give an answer. Mr. Cole then related some anecdotes of schools within his own experience, to show the truth of this observation. Mr. Mill went on to say—

> "I hold it therefore the duty of government to supply the defect by providing elementary schools, accessible to all the children of the poor, either freely, or for a payment too inconsiderable to be sensibly felt; the remainder of the cost to be defrayed, as in Scotland, by a local rate, that the inhabitants of the locality might have a stronger interest in watching over the management, and checking negligence and abuse."

A rate was a thing they hated in this country. To show how little they were really in earnest on the subject of education, it was a fact that not one town in England—not even Manchester itself, which had been begging for a local rate for the purposes of education, for the last ten years—was prepared to have a local rate administered by its municipal authorities, for teaching the people indiscriminately to read and write. Rates were odious things, and people were not sufficiently in earnest to bear such an infliction for the sake of education.

> "One thing must be strenuously insisted on; that the government must claim no monopoly for its education, either in the lower or in the higher branches; must exert neither authority nor influence to induce the people to resort to its teachers in preference to others, and must confer no peculiar advantages on those who have been instructed by them. Though the government teachers will probably be superior to the average of private instructors, they will not embody all the knowledge and sagacity to be found in all instructors taken together, and it is desirable to leave open as many roads as possible to the desired end. Nor is it to be endured that a government should, either *de jure* or *de facto*, have a complete control over the education of the people. To possess such a control, and actually exert it, is to be despotic. A government which can mould the opinions and sentiments of the people from their youth upwards, can do with them whatever it pleases."

That, he believed, was quite true; but at the same time he was not prepared to say that teaching people to read the free press of this country had any tendency to encourage despotism.

> "Though a government, therefore, may, and in many cases ought to establish schools and colleges, it must neither compel nor bribe any person to come to them; nor ought the power of individuals to set up rival establishments to depend in any degree upon its authorization. It may be justified in requiring from all the people that they shall possess instruction in certain things, but not in prescribing to them, how or from whom they shall obtain it."

That was the whole gist of the question of education in this country. When public opinion ripened to a demand for education, the only thing the state had a right to do was to step in on behalf of the poor and the feeble, and enable them to obtain it; and so far he hoped that all who, like himself, disliked government interference, would be prepared to go.

> "In the matter of education, the intervention of government is justifiable, because the case is not one in which the interest and judgment of the consumer are a sufficient security for the goodness of the commodity. Let us now consider another class of cases, where there is no person in the situation of a consumer, and where the interest and judgment to be relied on are those of the agent himself, as in the conduct of any business in which he is exclusively interested, or in entering into any contract or engagement by which he himself is to be bound.
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> "The ground of the practical principle of non-interference must here be, that most persons take a juster and more intelligent view of their own interest, and of the means of promoting it, than can either be prescribed to them by a general enactment of the legislature, or pointed out in the particular case by a public functionary. The maxim is unquestionably sound, as a general rule; but there is no difficulty in perceiving some very large and conspicuous exceptions to it. * * * The individual who is presumed to be the best judge of his own interests may be incapable of judging or acting for himself; may be a lunatic, an idiot, an infant; or, though not wholly incapable, may be of immature years and judgment. In this case, the foundation of the *laisser-faire* principle breaks down entirely. The person most interested is not the best judge of the matter, nor a competent judge at all. Insane persons are everywhere regarded as proper objects of the care of the state. In the case of children and young persons, it is common to say that though they cannot judge for themselves, they have their parents or other relatives to judge for them. But this removes the question into a different category, making it no longer a question whether the government should interfere with individuals in the direction of their own conduct and interests, but whether it should leave absolutely in their power the conduct and interests of somebody else. Parental power is as susceptible of abuse as any other power, and is, as a matter of fact, constantly abused. If laws do not succeed in preventing parents from brutally ill-treating, and even from murdering their children, far less ought it to be presumed that the interests of children will never be sacrificed in more common-place and less revolting ways to the selfishness or the mistakes of their parents. Whatever it can be clearly seen that parents ought to do or forbear for the interests of children, the law is warranted, if it is able, in compelling to be done or forborne, and is generally bound to do so.

To take an example from the peculiar province of political economy; it is right that children and young persons not yet arrived at maturity, should be protected, as far as the eye and hand of the state can reach, from being overworked. Labouring for too many hours in the day, or on work beyond their strength, should not be permitted to them; for, if permitted, it may always be compelled. Freedom of contract, in the case of children, is but another name for freedom of coercion. Education, also, the best which circumstances admit of their receiving, is not a thing which parents or relatives, from indifference, jealousy, or avarice, should have it in their power to withhold."

He knew of no treatise on education which seemed to him so clearly to define what was within the province of the state and what was not, as these passages which he had quoted from the writings of Mr. Mill. He would remark that, although they had the half-time system in factories, the introduction of that system into other fields of labour seemed to him a hopeless task of detail. He thought the one thing in which the state might usefully step in was to insist that a child under a certain age, be it 8, or 10, or 12 years, should not be employed unless it could read and write. To that extent he thought the government was entitled to go. He was not prepared to say that the present half-time system of education was the right one, or that it might not be carried further, but he hoped the meeting would go with him to the extent of saying that it was the bounden duty of the state to see that every child should be able to read and write.

The Rev. Dr. Booth, F.R.S., begged to recall the attention of the meeting to the great object of the very excellent paper just read, which appeared not so much to question the principle of the half-time system as to point out the inadequacy of the provision of the Factory Act, which constituted a mere shutting up within the four walls of a schoolroom the legal test of educational proficiency. It is no wonder that parents should seek to comply with such absurd and worthless conditions on the cheapest possible terms. He was entirely of opinion that the correlative conditions of supply and demand held as much in the case of education, or rather instruction, as in those of cotton or coal. Create a demand for education and the supply would be sure to follow. We had hitherto been going on the inverse principle, attempting to create an abundant supply for which there was no demand. He entirely agreed with the lecturer in his proposal to substitute attainments—certificated attainments, instead of an objectless confinement. He was much pleased to hear the preceding speaker (Mr. Cole), enunciate so clearly the true functions of the state in this matter of education; namely, to test results themselves, but not overmuch to interfere with, or scrutinise how or where the results had been obtained. It was a great satisfaction to him to hear such sentiments expressed, because they echoed the convictions he published in a pamphlet form, (little read he regretted to say at the time,) in which, under the title "Examination the Province of the State;" he endeavoured to lay down the true functions of the state in matters of education. He could not entirely agree with Mr. Redgrave in his regrets that the school-time had been cut down from six hours to three, were *bonâ fide* instruction given in the three hours, because we must not imagine that a child learns twice as much in six hours as he does in three. In this case twice three was not six, but very much less. He considered there were many advantages in the half-time system when faithfully carried out, it called into action all the powers of the mind and body; it had been tried in many places and its advocates spoke highly of it; among others, Mr. Paget, M.P. for Nottingham, who had tested it in agricultural employment. He might add that the same gentleman, and many others as well, with whom he had discussed the question, entirely approved of what this Society was doing, of which the course pointed out in the paper read that evening was an extension, to make proved instruction attested by an authorised certificate the passport to employment.

Mr. Charles Hindley, M.P., could not help regretting that this discussion had taken a wider and more general scope than the title of the paper indicated. He thought the half-time system, which had been introduced into the Factory Act, was at the time very properly objected to on the part of the trade, for he thought it was invidious to make a selection of the factory owners and put upon them the obligation to educate the children, a duty equally incumbent on other branches of industry. The fact that the children were collected together in large numbers in factories, did not render justifiable that measure of the government. Perhaps they would say—why interfere with the factories at all? Mr. Redgrave was, no doubt, aware that he (Mr. Hindley) had been an advocate of the Factory Bill all along, and he might be thought inconsistent in making the statement he did now; but he must be permitted to say, that the question of education and the laws of labour in the factories, rested upon very different principles. They had a right to impose upon the factory owner a restriction as to the hours of labour, for this reason—that factory labour was compound labour, but they had no right to restrict the employers of labour in other respects. They had the labour of the adult male and female, and also the labour of the child. Take the case of two knives,—take what they called at school a stick-knife and a pen-knife; it was quite obvious that while they could cut a stick with the stick-knife, they could not cut a stick with the pen-knife. Again, in a pair of scissors they had a tender blade and a strong blade combined in one instrument; they must confine the things they would cut with the scissors to what the lighter blade would allow them to do, or else they would destroy the instrument. He thought that was an illustration of the factory system. They could not employ the child with advantage to the state to such a degree as would destroy its physical energies,—that would be creating a great evil; and therefore they must adapt the number of hours of labour to the physical conditions of the two classes—the adult and the child. At the same time, he saw no ground why they should compel the factory owner to educate the people under him. The factory owners, he believed, were as desirous of educating the people, as any other portion of the community. He was convinced this compulsory system was injurious to the cause of the factory people, and had tended to make factory owners enemies to the cause of education generally. He had tried the voluntary principle, and thought whatever it accomplished, it accomplished better than compulsion, and as far as it went he should always advocate that principle. But would any one present say that the people could be educated upon the voluntary principle? He had raised £20,000 in one meeting towards that object and had travelled thousands of miles to raise subscriptions; but he had come to the conclusion, from the reasoning of Mr. Cole, as well as from his own observation, that in the present state of things the voluntary principle alone would not suffice. When he heard in the House of Commons of this objection to that scheme, and that objection to another scheme, and yet saw the ragged children running about the streets and courts, he said—let them have any and every scheme, so only that this state of things might be altered.

The Earl of Ducie expressed his gratification at hearing the very able paper of Mr. Redgrave. He had come to the conviction, which probably most of them had done—that the present half-time system, however well adapted as an initiatory measure for saving a vast number of children of tender years from labour which crushed them into physical deformity, had entirely failed, as an educational measure. Besides the other objections brought forward by Mr. Redgrave, there was one which, in his (Lord Ducie's) opinion, was the greatest objection of all, namely—that it seemed to be inapplicable as a general measure. Nothing short of the system of certificates seemed likely to meet the deficiency, and even in that he thought there would be difficulty in carrying out the various details.

The Rev. J. G. C. Fussell apprehended that the real difficulty in bringing this measure of Mr. Redgrave's into extended operation would be this: It could be easily applied to any large employers of juvenile labour, but the real question in his mind was how they were to get at the boys who were employed for half the day in private houses; how were they to bring the certificate system to bear upon them? He warned Mr. Redgrave that he would find great difficulty in carrying out his measure. It would be so completely to the interest of the boys employed, and those who employed them, to evade the law in this respect, that he was certain the evasions would be very numerous indeed. It was, however, consolatory to know that the cause of education had at least gained something by the provisions relating to factories.

Mr. C. Wentworth Dilke said it would always be a matter of great difficulty to secure agreement upon the question of the education of the masses. He thought one great merit of Mr. Redgrave's scheme was that it caught the very class which the last speaker said would endeavour to evade it. Practical education in the agricultural districts was far behind that in towns, where they had better opportunities of bringing children together in schools. In the agricultural districts he confessed he did not know how they were to be got hold of except by some system like that which Mr. Redgrave had sketched out; and for that reason he should be inclined to support the view taken.

Mr. G. F. Wilson, F.R.S., said that Mr. Redgrave in his valuable paper had expressed his opinion of the value of educational certificates, and Dr. Booth had spoken of education being made the pre-requisite of employment. The principle of making some schooling the condition of getting employment, had been partly tried at the factory day schools of Price's Patent Candle Company. A rule was made that children should only be taken into the works from the school; and after this the parents sent plenty of pupils.

The Chairman in moving a vote of thanks to Mr. Redgrave, said he believed his views upon the question of education were pretty well known in this Society. He had always been an ardent advocate of education in all classes—the upper, the middle, and the poor. The subject was one involved in many difficulties. In the first place, they must decide what education was? Did it mean merely reading and writing? That was not, in his opinion, what was meant by education; but was only a means to obtain an end. There being no definite idea of education in itself, what hope would they have of a satisfactory and fructifying result? It should be something more than mere reading and writing and the four first rules of arithmetic, if they wanted a community to become good citizens and good men. It had long been known, that in the lower classes of society parents would turn their children to profitable account so long as their necessities prompted them to do so. They knew, from the rate of wages, the difficulties with which the labouring classes had often to contend, and they would withdraw their children from school at the earliest possible period in order to turn their labour to account. It was this which led to the application of the law to the employment of children in factories. They formerly worked like pieces of mechanism, not like human beings, and remained pieces of mechanism or something worse to the end of their days. Therefore, the legislature insisted upon these children having education put in their way—no doubt in an inefficient manner—but to a certain extent it was placed within their reach. It was successful at first. The manufacturers submitted to it, and gave their aid to it, but they found, from the figures given by Mr. Redgrave, that the system gradually deteriorated. Why? Because the manufacturers would not be troubled with a greater number of children than was absolutely required, and they preferred adult labour at an increased price to that of children under such restrictions. The question then arose, could they compel people to send their children to school. No free country would submit to this. But if they made it worth the while of the parents to send their children to school, that was a different thing. How could they make it worth their while? By placing education within their reach, and making the labour of the educated child more valuable. Therefore he thought one solution, although a difficult one, was that suggested by Mr. Redgrave. As far as it went, it must, he thought, produce some practical results. The great question was, how could they induce parents to send their children to school? Difficulties ought not to deter them from making such efforts as would assist—though in a minor degree—to remove an evil which, as far as his own judgment went, was likely soon to plunge society into serious social difficulties. No doubt, from the principle advocated by this society, in the carrying out of which Dr. Booth had so much distinguished himself, the best results might be looked for, and he thought it was worthy the consideration of government whether the Mechanics' Institutions, as educational systems or centres, should not receive grants in aid, proper care being taken that the money was not misapplied.

Mr. Redgrave, in reply, said the only remark he would make was with regard to the statement of Dr. Booth, upon the half-time system, which had succeeded so well under Mr. Paget, at Nottingham. He (Mr. Redgrave) looked upon that as a model example. Mr. Paget, employing but comparatively few labourers, sent them to a school of his own—the schoolmaster himself taking great interest in the scholars. There it was natural that the system would succeed much better than was generally the case; but, taking the country through, they could not find the same amount of energy on the part either of the employer and the teacher as in the instance mentioned by Dr. Booth.

A vote of thanks was passed to Mr. Redgrave.

The Secretary announced that on Wednesday evening next, the 4th March, a paper, by Major H. B. Sears, "On Appliances for Facilitating Submarine Engineering and Exploration," would be read. Part I. Submarine Engineering.

GLYCERINE.

A correspondent in Guatemala says glycerine is invaluable for a tropical traveller; a little of it applied to a mosquito-bite instantly relieves; "no scratching and sores on the legs as before; it is perfectly marvellous; and I would not travel on these coasts without it now."

EDUCATIONAL MUSEUM AND MUSEUM OF PATENT INVENTIONS.

The annexed ground plan of the Museum building at Kensington shows the space therein allotted, on the 25th November last, by the Lords Committee of Privy Council for Trade for the Educational Museum, which has taken its rise from the Society's Educational Exhibition in St. Martin's Hall, many articles from which were presented to the Government through the Society of Arts, with a view to the establishment of a permanent museum of education.* It also shows the space allotted to the Commissioners of Patents for the Museum of Models of Patented and other Inventions. Such possessors of models as desire to have them exhibited in the Patent Museum at Kensington, should apply, stating dimensions, and the nature of the Invention illustrated, to the Superintendent, at the Great Seal Patent Office, 25, Southampton-buildings. All models or machines, whether presented to the nation through the Commissioners or lent for a limited period, will be kept in perfect order, and the latter returned to the depositors on demand. They should be sent as soon as possible, to enable the Museum to be open in April next. The public will be admitted free of charge after ten a.m. daily.

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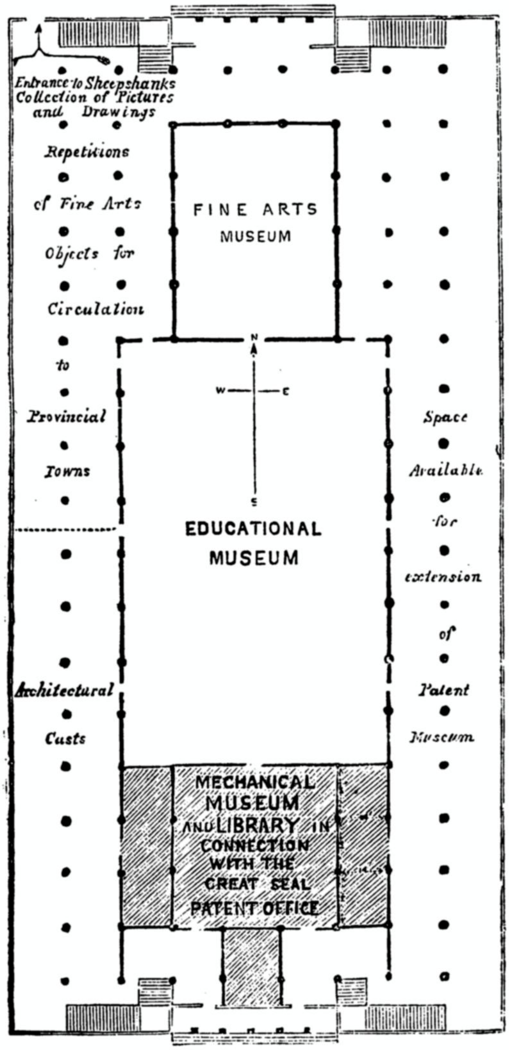
* The regulations with respect to the Educational Museum were given in the last Journal.—Ed. S. A. J.


Entrance to Sheepshanks Collection of Pictures and Drawings
Repetitions of Fine Arts Objects for Circulation to Provincial Towns
Architectural Casts
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EDUCATIONAL MUSEUM
MECHANICAL MUSEUM AND LIBRARY IN CONNECTION WITH THE GREAT SEAL PATENT OFFICE
Space Available for extension of Patent Museum

Scale fifty feet to one inch.]

Home Correspondence.

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THE WESTMINSTER CLOCK AND BELL.

SIR,—The only answer I shall give to the second edition of the letter which Mr. Loseby has got you to print, after the *Builder* had refused it and the *Mechanics' Magazine* had printed it, is that every material statement in it from beginning to end is false, and most of them false within his own knowledge. Anybody who cares to see this more particularly illustrated, may do so in the *Mechanics' Magazine* of February 7.

Besides the general enmity of the clockmakers, Mr. Loseby has special reasons of his own for hating me above most men upon earth, as I have exposed his horological pretensions on several occasions, and helped the Astronomer Royal and Mr. Dent to do the same. And people who in that frame of mind rush into print intending to commit murder, are very apt (as has been well said) to commit suicide by mistake instead.

I should think Mr. Baker, whose injuries Mr. Loseby invokes to help his own fictions, can fight his own battle as well as Mr. Loseby can do it for him. However, as he is invoked, I take this opportunity of saying that I have not the least intention of answering his pamphlet claiming the invention of the mode of hanging the Westminster bells, because I have met with nobody who does not say that there cannot be a better answer to this claim than the drawings he has given of his own plan, and of mine, which, he says, is identical with it.

The fact is, that everybody who has anything to do with the designing, casting, superintending, and hanging of the bells, has disapproved of his plan; which it is true enough that he offered and urged me to adopt, but after I had twice expressed my disapproval of it at the Institute of Architects, and exhibited the one intended to be used, which was approved by everybody who spoke about it, except, of course, Mr. Baker himself and a gentleman whom he brought there to read a paper for him.

I am, &c., E. B. DENISON.

Feb. 23, 1857.

THE ORIGIN OF THE MACHINE FOR MAKING ENDLESS PAPER, AND ITS INTRODUCTION INTO ENGLAND.

SIR,—Numerous persons having allowed themselves to be represented as the inventors of the paper machine, in various Encyclopædias and Dictionaries of Art,* and not having attempted to contradict what has been therein said, I feel bound, in justice to the real and first inventor, as well as to myself, to furnish the following authentic particulars relating to this useful and ingenious machine.

Louis Robert, a native of France, is the person to whom we are indebted for the paper machine. I had frequent opportunities of seeing him at work on his first model, in 1796, 1797, and 1798, at the Paper Manufactory at Essonnes, eight leagues from Paris, Département de Seine et Oise, (which at that period belonged to Monsieur Leger Didot, my brother-in-law), where Louis Robert was employed as book-keeper. His first model was no larger than a bird organ, and the slips of paper he made with it not wider than a piece of common tape, but of various lengths. Robert possessed a natural mechanical genius, and was never so happy as when employed in inventing or improving some piece of machinery, but unfortunately, the only time he could devote to his favourite pursuit was in the evening, after the counting-house business was over, and many a time I have heard him blamed and reproached by his employer, M. Leger Didot, for wasting so much time on an invention that would never be brought to perfection. However, Robert persevered, and in about two years, produced a model which performed so satisfactorily, that M. Didot was, at last, induced to afford him the means of making a machine upon a larger scale, which I shall call the working model. Orders were given to the carpenters, smiths, millwrights, and other workmen employed at the manufactory, to take directions from, and execute any work, that Robert might require for his paper machine. In a few months from that time, a machine was completed capable of making paper of the width of Colombier, and of various lengths, being the kind of paper usually employed for paper hangings, of which the consumption in France is immense. Owing to the great difficulty, at that time, of sizing and pressing sheets of paper of great length with the presses usually employed in paper mills, the length was generally limited to twelve yards, but a fresh difficulty arose in the process of drying it; it was suspended on lines in the drying loft, but from its weight when in the wet state it contracted so much in the middle, during the drying, that it was rendered unfit for the use of the paper stainers; the next attempt was by laying these long sheets horizontally on the lines; and by adjusting several of the frames or treblets on a level line, the inconvenience of the partial shrinking of the paper when suspended in a vertical direction was remedied. Many of these long sheets were sold to the paper stainers of Paris. After a series of experiments and improvements, Louis Robert applied to the French Government for a patent, or brevet d'invention, which he obtained in 1799, for a term of 15 years, and was awarded the sum of 8000 francs in testimony of his ingenuity. The specification of this patent is published in the second volume of the Brevets d' Inventions Expirés. M. Leger Didot, at that time, was proprietor and sole director of the paper manufactory at Essonnes, and had contracted with the Government for making the paper for the assignats; this paper was frequently sent in a damp state, in covered carts, drawn by post horses, to the printing office in Paris, was immediately printed and signed by the proper authorities during the night, and as soon as the paper was sufficiently dry, it was issued in the morning to the public. I remember that numerous laughs and jokes took place when M. Didot returned from Paris with a small bundle of assignats under his arm, which was all that he had received in payment of the many cartloads of paper with which he had supplied the government. The only difference was that they had been printed and signed by some of the revolutionary demagogues, then at the head of the government.

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* As an example, "*The Imperial Dictionary,*" *English, Technological, and Scientific.* Blackie and Son, Glasgow, Edinburgh, and London.

"PAPER MACHINE.—The machine now used for this purpose is that invented by the Messrs. Fourdrinier. The paper produced by it comes from the machine in an endless web, dried and finished."

Under the word "Paper," in this dictionary, it is stated that Messrs. Louis Robert and Fourdrinier *invented* the machine for making paper. In 1830 a sheet was made 13,800 feet long, and 4 feet wide, in Derbyshire.

The fate of the assignats is well known. I recollect being in Paris during the time they were ordered to be burnt, and I saw their fragments flying over the heads of thousands of persons who had been utterly ruined by their introduction. About this time M. Didot purchased Louis Robert's patent and paper machine for 25,000 francs, to be paid by instalments; but not fulfilling his engagements, the latter commenced legal proceedings against M. Didot, and recovered possession of his patent, by a decision dated 23rd June, 1801. But before that, and about the end of 1800, M. Didot had proposed to me to go over to England and take out patents there for the paper machine, my remuneration to come out of the profits that might be obtained. At that period I held a situation under the British government, in the office of Captain James Coates, of the Royal Navy, who was the British Commissioner for the exchange of prisoners of war in France; and after consulting with that gentleman, and receiving his sanction and advice, I agreed to embark in the undertaking, and to quit Paris in a fortnight, and being an Englishman, and in the employ of the British government, I had no difficulty in obtaining a passport. In the month of March, 1801, I left Paris to proceed to London, and Captain Coates gave me a letter of introduction to T. Mantell, Esq., at that time Mayor of Dover. On arriving at Dover I lost no time in waiting upon that gentleman, who, with true English hospitality, invited me to dine with him, to meet a few of his friends from London, amongst whom was Mr. Millikin, a gentleman residing in Norfolk-street, London. In the course of conversation, during the evening, I informed Mr. Millikin that I was on my way to London to take out patents for a machine for making paper, upon which Mr. Millikin said, that on his return to London, he should be most happy to introduce me to one of the most respectable wholesale stationer's houses in London, that of the Messrs. Bloxam and Fourdrinier. I said I should feel happy to avail myself of the introduction. Upon Mr. Millikin's return to London, I accompanied him to Sherborne-lane, and was introduced to the above-named firm, to whom he mentioned that I was taking out patents for a machine for making paper upon an entirely new principle, and at the same time showed them nine or ten rolls of paper of great lengths, which had been made by Louis Robert's paper machine at Essonnes, with which they were much pleased and astonished. Previous to parting, they said they should be happy to purchase a share in the patents, and requested that they might have the first offer. Soon after the patents were obtained, an agreement was entered into with me for the purchase of one-third of the patent rights, and *this was the first transaction by which the* Messrs. Fourdrinier *became connected with, and interested in the paper machine.* It was a commercial speculation on their part, which unfortunately did not prove a profitable one, either to themselves or to any of the persons originally connected with it. In the latter part of the year, 1801, I returned to France, for the purpose of having correct drawings made of the machine,—indeed exact copies of those delivered by Louis Robert when he obtained his patent from the French Government. The drawings here alluded to are those I delivered with my specification for my first patent in 1801, and were deposited in the Enrolment Office in Chancery-lane, London. During the short time I remained in Paris, I concerted measures with MM. Leger Didot, and Louis Robert, to have the original working model, which was then at Essonne, sent over to England, as it would materially assist in the construction of other machines. After much trouble and expense, the model arrived safely in London. The short peace (or rather the preliminaries of that desirable event) which took place in 1802, afforded M. Leger Didot the opportunity of coming over to England, when I introduced him to Messrs. Bloxam and Fourdrinier. It being thought desirable to commence a series of experiments for improving the machine, the working model was sent to the factory of Mr. John Hall, at Dartford, who was at that time the millwright of the above firm. As soon as the model was erected and fit for work, different improvements were attempted, and M. Didot and myself passed the greater portion of our time at Dartford, in suggesting, making, and superintending the alterations required. At that period, the late Mr. Bryan Donkin was engaged in business with Mr. Hall, and, being an extremely ingenious and clever mechanician, assisted most materially in improving the paper machine, and in 1803, the French working model, after nearly three years' diligent and unremitting experiments and improvements, was erected at Frogmore Mill, near Two Waters, in Hertfordshire. I left London and removed to Two Waters, for the purpose of superintending and explaining to the different manufacturers, (who had been invited to inspect the machine,) the great advantages it possessed over the old method of paper-making.

In 1805, an entirely new machine was erected at Two Waters Mill, capable of making paper 54 inches wide, and containing all the latest improvements made up to that period. I continued superintending the new machine until 1807, when I removed to St. Neots, in Huntingdonshire, where premises were taken by the Messrs. Fourdrinier for the purpose of erecting the two machines, which I had reserved the exclusive right of using for my own benefit. I entered into partnership with Messrs. H. and S. Fourdrinier, the profits to be divided in equal third shares; the business to be carried on under the firm of John Gamble and Company, which it continued to be until 1811. Messrs. Fourdrinier had agreed, by the articles of partnership, to advance the capital required for carrying on the concern, erecting all the machinery required in a paper manufactory, and the two paper machines which I had the exclusive and unlimited privilege of using for my own benefit, without paying any of the royalties. The unlimited quantity of paper I might manufacture with them, rendered them worth £5,000 each, and in corroboration of this fact, Messrs. Phipps, of Dover, and Mr. Swan, of Evensham, in Oxfordshire, paid £5,000 each for their paper machines as well as for any quantity of paper they might manufacture.

In or about 1809, Messrs. Henry and Sealey Fourdrinier made over to Mr. Matthew Towgood the whole of their interest in the St. Neots Mill, and Mr. Towgood undertook to perform all the engagements entered into by the Messrs. Fourdrinier with me. When Mr. Towgood had the mill transferred to him, only one of my paper machines was erected, the second having been sold to Mr. Bartholomew Sullivan, of Dripsey, near Cork. My two machines were my capital in the concern, but. unfortunately for me, this had not been stated in the partnership deed. Mr. Towgood objected to advance the capital for erecting the second machine unless I would pay my share. Mr. Towgood knew that I had not the requisite capital, and he then determined upon dissolving the partnership, by which act I was deprived of all my interest in the concern, after having sacrificed ten years of the best part of my life to the paper machine.

I am, &c., JOHN GAMBLE.

5, Hanley-road, Hornsey-road, London.

MACHINERY AND WORKMEN.

Sir,—The valuable and interesting paper read by Mr. Anderson, on the 28th ult., on the application of machinery to manufactures, produced a discussion that opened up a subject which I consider of no less importance than the application of machinery, and equally deserving the serious attention of the Society of Arts, and also of every individual, although it did not appear quite relevant to the subject then under consideration. I refer to the statements then made by Mr. Hobbs and Mr. Webster, in reference to the difficulties which appear to arise with the invention of labour-saving machines, and to expand with the development of their powers, as illustrated in the very numerous recorded instances of the obstacles presented to the introduction of such machines into use, by the prejudices of the workmen, sometimes exciting the most determined opposition, even when the wages of the workmen are increased by the introduction of such machines in the process of manufactures; an apparent anomaly, which, Mr. Hobbs told us, was peculiar to the British workman, and did not extend to the United States of America, where the workmen were not only ready at all times to accept the aid of machinery, but were most willing to complete or improve any new machine associated with their labour; now, if such is a fact, which I believe it to be, I think the investigation of the causes producing such results may lead us to the solution of a difficulty which still remains one of the greatest impediments to the adaptation of science to the manufacturing arts.

The nature of man, either in Great Britain or America, is identically the same; therefore such an opposite feeling in the workmen of the two nations, under the assumed same circumstances, must result from a different educational training, or the supposed uniformity of circumstance must be a great fallacy.

That such difference of feeling and action does not result from education, is clearly shown by the fact that a great number of American workmen are of British growth, and no education could suddenly transmute the dissatisfied opponent into the willing and active cooperative assistant.

The cause of such anomaly must be sought for from other and more powerful influences, and a key to the solution of this important problem is, I think, to be found in the existence of such opposite feelings in two sections of the world's industry.

The assumption may be true, and I believe it is so, that the introduction of machinery not only lightens labour, but that it often increases the wages of the workmen whose industry is associated with it, and this equally whether the application is made in Great Britain or America; but here the parallel ceases, for we are told by the exponents of the theory of the inherent prejudice of the British workman, that the development of mechanical appliances to manufactures in America is excited into vigorous action by the much greater scarcity of manual labour, which always stimulates the design and application of labour-saving machines, and, therefore, such application will never excite the prejudice or opposition of any workmen, while they see and feel before them fresh channels of certain occupation, which is the case in the United States of America. But how stands the fact in Great Britain, where a large amount of pauper and criminal labour, which might be profitably employed, is suppressed, lest it should, by coming into competition with the already overstocked market of honest industry, increase the depression of wages; and where there are such causes for fear, is it surprising that the prejudices of British workmen should be excited by the application of the mighty arms of machines, when made to compete with human muscle and sinew, for we cannot disguise the fact, that where a balance of labour and employment exist together, the introduction of any power which increases production, if placed in competition with human labour, must always depress it in a corresponding degree.

These remarks are not intended as an exposition of a subject of the very highest importance, but merely to suggest the necessity of taking into our consideration an influence so powerfully operating upon the application of labour-saving machines to our manufactures and commerce, and in justice to the skilled workmen whose occupation is being superseded by unskilled labour in association with mechanical precision.—I am &c.,

E. NASH.

30, Coppice-row, Clerkenwell, Feb. 10th, 1857.

NAVAL SEMINARIES.

Sir,—It is to be regretted that whilst the Society of Arts is exerting itself so judiciously to promote education, Government should do next to nothing towards the provision of competent persons to supply the different grades in its employ. It would have been far otherwise had the establishment of Naval Seminaries, as successtively determined on by the Earls Spencer and St. Vincent, been carried out. Though it is not likely that, after the lapse of nearly 60 years, Naval Seminaries should in all particulars be found suitable to the present day, yet as they might afford hints for the formation of such establishments now, I venture to submit an outline of Sir S. Bentham's scheme, as proposed and approved of by Earl Spencer at the end of the last century. This plan provided, in the first place, that Government should be at no expense for education, for though boys might be admitted into the seminaries at the early age of seven, paying a smaller sum than could defray their expenses at home, they were to employ a part of their time in useful works, by which their expenses would be fully compensated. There were to be three different classes of pupils. The first class being that of superior officers both in the civil and military service, who were to receive a gentleman's education; the second was to consist of those intended for clerks and similar occupations on shore, or for warrant officers on board ship; the third class was for boys intended as mere operatives. The three classes were to be treated alike in regard to sanitary arrangements, but their food, clothing, &c., to be regulated according to their respective stations in life. All were to work a portion of their time, as Sir Samuel conceived that an adequate knowledge of manual labour could only be acquired by practice, but the working hours were not allowed to encroach on the time required for higher attainments. In order to excite emulation and to reward the most deserving, any boy might, at the periodical examinations, be raised from the lowest to the second class, and again, a lad who had attained the necessary qualifications, might ascend from thence to the highest class. For further particulars, I beg to refer to Sir

Samuel's "Answer to the Comptroller's Objections," pp. 104 to 113; to his "Statement of Services," pp. 12 to 14; and to the report of the Admiralty to the Privy Council in 1801.—I am, &c., M. S. BENTHAM.

26, Wilton-place, Feb. 12th.

DECIMAL COINAGE.

SIR,—I beg you will grant me a little space to correct an erroneous statement in Professor De Morgan's paper, "On Decimal Coinage," in this year's *Companion to the Almanac*.

Referring to the debate of 1855, he accuses the Chancellor of the Exchequer of "playing with statistics," by putting forward, "under four different sets of names, as four different plans, the farthing system, which proposes coins of ¼d., 2½d., 2s. 1d., and £1 0s. 10d. Thus, in one system, a farthing is called a *cash*, in another a *mil*, and so on; it being the same farthing throughout."

With respect to one, at least, of these plans, Mr. De Morgan is entirely mistaken. As its humble proposer, I beg to refer for details to your Journal, Vol. III., page 390, where it will be seen that the "cash" was *not* the $\frac{1}{48}$th of a shilling as asserted by Mr. De Morgan, but the $\frac{1}{50}$th of a shilling, expressly mentioned (*Times* report) by the Chancellor of the Exchequer.

My proposal likewise materially differed from that of Mr. William Brown in rendering unnecessary a fourth copper token, by the simple expedient of making the penny-piece count for *five* "cash" instead of *four* "mils," and the halfpenny and farthing for two "cash" and one "cash" respectively.

I have since submitted to your readers my reasons for abandoning altogether the *millesimal* division of the pound as the basis of a new system.

I am, &c.,
S. A. GOOD.

H. M. Dockyard, Pembroke-dock, Feb. 9, 1857.

Proceedings of Institutions.

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POOLE.—The second *Conversazione* in connection with the Town Library Literary and Scientific Institution was held at the Town-hall on Monday the 2nd inst. Amongst those present were M. Kemp, Esq., E. Kemp Welch, Esq., the Misses Welch, and the Misses Welch of Christchurch; the Rev. G. Morgan, Mrs. Morgan, Isaac Steele, Esq., Morris Were, Esq., A. P. Hamilton, Esq., M.D., and Mrs. Hamilton, the Rev. E. R. Conder, the Rev. R. Goulty, G. B. Aldridge, Esq., and Miss Aldridge; —McGilvery, Esq., G. Belben, Esq., and Mrs. Belben; T. Durant, Esq., Miss Gosse, Mrs. and Miss Wanhill, J. B. Durell, Esq., D. Durell, Esq., Miss Pardy, J. Adey, Esq., Mrs. Adey and family, Mrs. J. Adey, Miss Adey, T. Eliott, Esq., and Mrs. Eliott, W. C. Nutt, Esq.; Mrs. Churchill, the Misses Chrchill, Mr. and Miss Chaman; E. Mullett, Esq., Mrs. C. Hill, Miss Lacy, Mrs. James Slade, Mrs. Parmiter and Miss Kent, F. Saunders, Esq., T. Saunders, Esq., J. Gould, Esq., J. W. Whelan, Esq., J. Crabbe, Esq., Mrs. and Miss Crabbe, &c., &c. The chair was taken by M. Kemp Welch, Esq., who, regretting the absence of the Hon. and Rev. Samuel Best, called up the Rev. E. R. Conder, who said, that if such Institutions as these were really to tell upon the progress of national education, they must not be made Institutions for the purpose of amusement, but for application to useful practical subjects and hard study. No man became wise by play; neither did any nation become great or wealthy by play. There must be hard work in order to the acquisition of anything which was worth possessing. The question was—in what manner could Literary and Scientific Institutions be made proper means of furthering education? The rev. gentleman then directed the attention of the meeting, to the plans now being carried out by the Society of Arts.—Some very beautiful specimens of Mosaic tiles, manufactured by the Patent Architectural Pottery Company, and many other objects of interest were exhibited in the room, and the evening was enlivened by some good music.—At the annual meeting of the members, recently held, J. Gosse, Esq., in the chair, the report for the past year was read. The Institution at the present time is in a very flourishing condition. The library has been thoroughly repaired, and all the books have been arranged under the different subjects of which they treat. It now contains upwards of 1800 vols.; 160 vols. have been received from Mudie's Circulating Library, making a total of nearly 2,000 vols., to which the members have free access. A new News Room has also been made, distinct from the library. These improvements have been effected out of the annual income of the Institution, which for this year has been £117 12s. The current expenses of the year have been £96 5s. 8d., leaving a balance of £21 available for other purposes. The following gentlemen were unanimously elected to the respective offices:—President: Colonel Waugh; Vice-Presidents: Admiral Brown, J. Adey, J. Browne, J. Durant (Mayor), T. Durant, J. Gosse, W. Pearce, R. Slade, James Slade, I. Steele, M. Kemp Welch, Esqs., H. M. Aldridge, Esq., Treasurer: J. B. Durell, Esq., Librarian: Edwin Kemp Welch, Esq., Curator; Secretary, Mr. W. Penney: Committee; G. H. Gutch, J. Gould, C. Keates, J. W. Martin, E. Mullett, S. Pettit, Joseph Rickman, C. J. Stone, F. Styring, J. Touchet, J. W. West, Esqs., and Mr. J. Budden. In acknowledgement of the valuable services rendered to this Institution during a long course of years by the late Curator, Mr. J. Budden, the thanks of the meeting were cordially awarded to him. A vote of thanks to the Chairman concluded the proceedings.

To Correspondents.

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ERRATUM.—In the last number of the *Journal*, page 212, col. 1, line 63, for "inches" read "miles."

MEETINGS FOR THE ENSUING WEEK.

MON. Royal Inst., 2. General Monthly Meeting.
London Inst., 7. Rev. H. Christmas, "On the History and Antiquities of Heraldry; and on some other branches of British Archæology."
Chemical, 8. Prof. Abel, "On recent Improvements in the Manufacture of Iron."
Entomological, 8.
Med. and Chirurg., 8. Anniversary.
TUES. Royal Inst., 3. Prof. Huxley, "On the Sense of Sight."
Civil Engineers, 8. Mr. Jabez Church, C.E., "On the Results of the Use of Clay Retorts for Gas-making."
Linnæan, 8. Prof. Owen, "On the Characters and Subdivisions of the class *mammalia*."
Pathological, 8.
WED. London Inst., 3. Mr. E. W. Brayley, "On Mineralogy and Crystallography."
Royal Soc. Lit., 4½.
Society of Arts, 8. Major H. B. Sears, "On appliances for facilitating Submarine Engineering and Exploration." Part I. Submarine Engineering.
Microscopical, 8.
Pharmaceutical, 8½.
THURS. Royal Inst., 3. Prof. Tyndall, "On Sound."
Philosophical Club, 5½.
London Inst., 7. Dr. R. E. Grant, "On the Natural History of Extinct Animals."
Antiquaries, 8.
Philological, 8.
Photographic, 8.
Royal, 8½.
FRI. Archæological Inst., 4.
London Inst., 8½. Mr. E. B. Denison, "On the Great Bell of Westminster."
SAT. Asiatic, 2.
London Institution, 3. Mr. T. A. Malone, "On Experimental Physics, chiefly in Relation to Chemistry."
Royal Institution, 3. Prof. Phillips, "On the Origin and Progress of Life on the Globe—Vertebrata."
Royal Botanic, 3¾.
Medical, 5. Anniversary Oration.

PARLIAMENTARY REPORTS.

SESSIONAL PRINTED PAPERS.

Par. No.

Delivered on the 14th and 16th February, 1857.

Affairs of Naples—Correspondence.
Queen's College, Galway—Report.
Queen's College, Belfast—Report.
Prisons—Twentieth Report of the Inspectors (Home District), Part I.

Delivered on the 17th February, 1857.

23. Savings' Banks (Number of Depositors, &c.)—Account
24. Savings' Banks (Sums paid in or withdrawn by the Trustees)—Return.
28. Russian Dutch Loan—Account.
29. Sardinian Loan—Account.
30. Greek Loan—Account.
43. Paupers—Returns (a corrected copy).
6. Bill—Reformatory Schools.

Delivered on the 18th February, 1857.

4. Grants for Religious Purposes—Return.
26. Naval Receipt and Expenditure—Account.
36. Bank of England—Copy of Applications, &c.
39. Bullion (Bank of England)—Return.
45. Local Acts (1. Birkenhead Docks—Construction ; 2. Carlisle, Liddesdale, and Hawick Railway ; 3. Ely Tidal Harbour and Railway ; 4. Great Yarmouth Britannia Pier ; 5. West Somerset Railway ; 6. West Somerset Mineral Railway)—Admiralty Reports.
China (Registration of Vessels at Hong Kong)—Correspondence.

Delivered on 19th February, 1857.

35. Bank of England—Annual Accounts.
40. Mint—Account.
44. Trade and Navigation Accounts (31st December, 1856).
55. Debt (Funded and Unfunded)—Return.
16. Bill—Public Health Supplemental Bill (1857).

Delivered on 20th February, 1857.

2. County Elections—Return.
8. Highways (Metropolis)—Return.
38. Education (Capitation Money)—Return.
42. Army in the East—Return.
17. Bills—Lunatic Asylums (Ireland).
18. ——— Sea-coast Fisheries (Ireland).
21. ——— Education (Cities and Boroughs).
Fire Insurance Duties—Report by Mr. Coode.

Delivered on the 21st and 23rd February, 1857.

47. Poor-relief (Ireland)—Returns.
27. Irish Reproductive Loan Fund—Account.
50. Bishops (Scotland)—Correspondence.
54. Court of Chancery—Return.
56. Criminals—Copies of Memorials.
11. Bills—Industrial Schools.
22. ——— Extra-parochial Places.
24. ——— Minister's Money (Ireland).
27. ——— Lighting of Towns (Ireland).
Marriages in Ireland—6th Report of the Registrar-General.
Operations in the Canton River—Further Correspondence.
China (Entrance into Canton)—Correspondence.
Civil Service Commissioners—2nd Report.

Delivered on the 24th February, 1857.

57. Army, Crimea—Returns.
33. Army Estimates.
Insults in China—Correspondence.
Queen's College, Cork—Report.

Delivered on the 25th of February, 1857.

19. Harbour, &c., Bills (1, St. Helen's Canal and Railway; 2, Clyde Navigation)—Report of the Board of Trade.
44 (1). Trade and Navigation Accounts (31st January, 1857).
49. Spirits (Navy)—Copies of Contracts.
23. Bill—Court of Chancery (Ireland)—(Titles of Purchasers).
25. Bill—Court of Chancery (Ireland).

PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette, February 20th*, 1857.]

Dated 17th December, 1856.

2993. Godwin Meade Pratt Swift, Viscount Carlingford, Swiftseath, Kilkenny—An aerial chariot or apparatus for navigating the air.

Dated 2nd February, 1857.

17. John Wilson, St. Helen's, Lancashire—Improvements in the manufacture of steel.

Dated 8th January, 1857.

64. Julius Goodman, Abraham Myers, and Louis Goodman, 25, King David-lane, Shadwell—Improvements in the manufacture of caps or coverings for the head.

Dated 21st January, 1857.

186. Henry Medlock, 20, Great Marlborough-street, Westminster—An improved method of purifying water.

Dated 26th January, 1857.

226. Adolphe Hensel, 4, Stafford-place, Pimlico—The manufacture of German yeast from flour.

Dated 2nd February, 1856.

303. John Henry Johnson, 47, Lincoln's-inn-fields—Improvements in heating the feed-water of steam-boilers. (A communication.)

Dated 3rd February, 1856.

311. Richard Laming, Hayward's-heath, Cuckfield, Sussex—Improvements in purifying gas, in obtaining materials useful for that purpose, and in working up into useful products certain ammoniacal and phosphatic substances obtainable as residues in the purifying of gas.
312. James Taylor, Middlesbrough-on-Tees, Yorkshire—Improvements in the governors for the engines of screw steamers, and other vessels propelled from the stern.
313. James Taylor, Middlesbrough-on-Tees—A compensating crane.
314. George White, 5, Laurence Pountney-lane, Cannon-street—Certain improvements in dyeing and printing textile fibres and fabrics. (A communication.)
315. Charles Cochrane, Ormesby Iron Works, Middlesbro'-on-Tees—An improvement in heating blast for blast furnaces and cupolas.
317. Henry Unwin, Sheffield—Improvements in the application of waste heat from coke ovens.

Dated 4th February, 1857.

318. Andrew Steinmetz, Middle Temple—A method, mode, contrivance, or management to check the honesty of omnibus conductors and other receivers of money under similar circumstances, to be accounted for to their employers, without machine or mechanical appliance.
319. James Hamsher, 16, Elizabeth-street South, Pimlico—Improvements in the manufacture of blacking for polishing, softening, and preserving boots and shoes, and other leather articles.
320. Odoardo Gandine, 4, Newman-street, Oxford-street—An indicating target.
321. Edward Lewis and Gideon Bohm, Coleman-street—Improvements in printing in colours, called an improved photogalvanographic chromographic process.
323. Saul Hart, 33, Portland-street, Liverpool—Improvements in apparatus for raising and forcing water.
324. Charles De Bergue, 9, Dowgate-hill—Improvements in the method of, or apparatus for, laying the permanent way of railways.
325. William Edward Newton, 66, Chancery-lane—Improvements in pianofortes. (A communication.)
326. Alfred Vincent Newton, 66, Chancery-lane—An improvement in machinery for polishing flat surfaces of glass and other substances. (A communication.)
327. James Burrows, Wigan—Certain improvements in steam engines.
328. John Henry Johnson, 47, Lincoln's-inn-fields—Improvements in the treatment of flax and similar textile materials. (A communication.)
329. Robert Holmes Houston, Greenock—Improvements in effecting general conveyance or transport on water.

Dated 5th February, 1857.

330. Thomas Summers, Northam Iron Works, Southampton—Improvements in gauges for indicating pressure and vacuum.
331. Philipp Schafer and Frederick Schafer, Brewer-street—Improvements in travelling bags, or cases, and an apparatus for carrying fittings therein.
332. Alfred Vincent Newton, 66, Chancery-lane—An improvement in casting metallic articles. (A communication.)
333. Clarance Brazil and William Nicholas Crummack, Chorley, Lancashire—Improvements in looms for weaving.
334. Henry Smith, Stamford, Lincolnshire—Improvements in haymaking machinery.
335. William Edward Newton, 66, Chancery-lane—Certain improvements in breech-loading fire-arms. (A communication.)
336. George Chowen, 7, James-street, Covent-garden—Preventing further casualties on the Goodwin Sands.

Dated 6th February, 1857.

337. Thomas Stott, Sabden, near Whalley, Lancashire—Improvements in pickers.
339. William Green, Pembroke-cottages, Caledonian-road, Islington—Improvements in manufacturing or producing substitutes for leather for boots, shoes, and other uses, and in machinery or apparatus for effecting the same.
340. Richard Archibald Brooman, 166, Fleet-street—Improvements in preparing or dressing threads and other fibrous materials, and in the machinery employed therein. (A communication.)
341. James Gilroy, Auldhousefield, near Pollockshaws, Renfrew—Improvements in applying starch or other semifluid matter by machinery to woven fabrics.
342. John Mayo Worrall, Salford—An improvement in finishing a certain description of fustians called "diagonals."
343. George Wright, Sheffield—Improvements in stove grates or fireplaces.
344. Thomas Newton, Walsall—Improvements in the construction of Stockmen's saddles and appendages thereto. (Partly a communication.)
345. Antoine Dècle and François Alexandre Drault, Paris—Improvements in the manufacture of bracelets.
346. Pierre Poisson, Paris—Improvements in preparing and applying surfaces for painting.

Dated 7th February, 1857.

347. Henry Heald and Arthur Heald, Sabden Whalley, Lancashire—Improvements in looms, and in pickers used for weaving.
348. Nicholas Nomico, Manchester, and George Heyes, Bury—Improvements in looms.
349. James Alfred Limbert, Royal Navy—Improvements in marine steam engines.
350. John Coope Haddan, 4, Cannon-row, Westminster—Improvements in marine steam engines. (A communication.)

351. Charles Crickmay, Guildford-place, Lower Kennington-lane—Certain improvements in breech-loading guns or pistols for military and other purposes, and which said improvements are applicable, and will admit of being applied, to guns or pistols now in use.
352. Francis Wrigley, Manchester—An improved apparatus for cutting tobacco.
353. John Henry Johnson, 47, Lincoln's-inn-fields—Improvements in casting metals. (A communication.)
354. Joseph Nicolas Victor Cadiat, Paris—The application of centrifugal force in purifying minerals, or any other similar hard substances, by washing.
355. Joseph Skertchly, Culford-road, De Beauvoir-square—Improvements in, and in the manufacture of saggers.
356. William Greenslade, Bristol, and James Wood, Saint Pancras—Certain improvements in brushes, especially applicable to painters' brushes.
357. James Taylor, Upper-street, Islington, and Edward Owen, Aberdeen-terrace, Blackheath—Improvements in the manufacture of yellow prussiate of potass.
358. Felix Lieven Bauwens, Ranelagh-road—An improved mode of treating and distilling fatty matters, and in the apparatus employed therein.
359. Thomas Brown and George Parry, Ebbw-vale, Monmouth—Improvements in the manufacture of iron.
360. Richard Archibald Brooman, 166, Fleet-street—An improved method of obtaining motive power. (A communication.)
361. Richard Archibald Brooman, 166, Fleet-street—Improvements in measuring the capacity and contents of casks and other similar vessels, and in instruments or apparatus employed therein. (A communication.)
362. George Tomlinson Bousfield, Sussex-place, Loughborough-road, Brixton—Improvements in lamps adapted for burning resin oil. (A communication.)
363. William Hirst, Bath—Improvements in manufacturing felted fabrics.
364. William Wilkens, Baltimore, U.S.—An improved cannon, which he calls a revolving battery. (A communication.)
365. Perceval Moses Parsons, Duke-street, Adelphi—Improvements in the permanent way of railways.

Dated 9th February, 1857.

366. James Murdoch, 7, Staple-inn—An improvement in the process of treating the threads of floss silk, which is also applicable to the threads of other fibrous materials. (A communication.)
367. James Taylor, Britannia Works, Birkenhead—Improvements in machinery for crushing various substances.
368. Henry Cartwright, Dean Broseley, Shropshire—Improvements in the application and mode of working eccentrics on steam engines.
369. Charles Turner and Louis Watermann, Liverpool—Improvements in or applicable to the class of hats made from straw, grass, palm leaf, or other like materials.
370. Léon Talabot, 57, Chaussée d'Antin, Paris—Improvements in the manufacture of iron and steel.
371. Joseph Fenn, Newgate-street—An improvement in oil-cans and other like vessels. (A communication.)
372. David Falconer, 68, Causeyside, Paisley—Improvements in the mechanical arrangement for raising and forcing of water or other fluid, air, or gases.
373. John Harding, Beeston Manor Iron Works, Leeds—Improvements in the treatment of metallic ores.
374. Thomas John Taylor, Sekforde-street, Clerkenwell—An improved construction of stereoscope.
375. Samuel Groves, Judd-place East—Improvements in organs.
376. Henry Willis, Manchester-street, Gray's-inn-road—Improvements in organs.

Dated 10th February, 1857.

377. William Thomas Walker, 55, King-square, St. Lukes—Improvements in apparatus used in gas works for exhausting, forcing, transmitting, and regulating the flow of gas, and cleansing and warming gas apparatus.
378. Abel Stokes, Birmingham—New or improved machinery to be used in the manufacture of nails, pins, screws, and other similar articles.
379. Julian Bernard, the Albany, Piccadilly—Improvements in the manufacture or production of boots and shoes, or coverings for the feet, and in the machinery or apparatus employed in such manufacture.
380. Daniel Benjamin Herts, Bunhill-row—Improvements in apparatus for stamping and embossing. (A communication.)
381. Benjamin Webster Owrid, Dundalk, Louth—An improved method of connecting and disconnecting pipes or tubes.
382. Joseph Graham and James Shepherd, Burnley, and Thomas Whitaker, Acrington—Certain improvements in power looms for weaving.
383. Jabez Morgan, Kidderminster—Certain improvements in the manufacture of steel and iron wire for umbrella and parasol frames.
384. William Richelieu Hodges, Manchester—Improvements in the manufacture of an elastic material, and of its application to certain purposes.
385. Austin Chambers, Canterbury, and William Harrison Champion, Lynsted, Kent—A mode of working railway breaks.
386. George Bedson, Manchester—Improvements in coating metal with metal and metallic compounds.
387. August Frederick William Partz, New York—An improved method of evaporating fluids, condensing and absorbing vapours, gases, and fumes, arresting and precipitating floculent, metallic, or other particles, and transferring heat from air or steam to fluids and pulverulent substances.
388. Thomas Fielding Johnson and John Williams, Leicester—Improvements in screw gill machinery for preparing wool and other fibrous materials.
389. John Forrest Watson, St. John's-square, Clerkenwell—Improvements in the construction of watches.
390. Jesse Bridgwood, Burslem, Staffordshire Potteries—Improvements in connecting pipes to the basins of water-closets and wash-hand basins, and also in the means of stopping the outlets of wash-hand basins.
391. William Wood Pilcher, St. Margaret's-at-Cliffe, Dover—Improvements in straw shakers of thrashing machines.
392. Abraham Royds and John Kenyon, Lower-place, Rochdale—Certain improvements or a certain improvement in machines for spinning or doubling, commonly known as throstles.
393. Richard Archibald Brooman, 166, Fleet-street—An improvement in or addition to the locks of fire-arms. (A communication.)
394. Thomas Howard, King and Queen Iron Works, Rotherhithe—Improvements in the construction of cranked shafts or axles.
395. Henry Heald and Arthur Heald, Sabden Whalley, Lancashire—Improvements in pickers and picker checks employed in weaving.
396. Henry Tibbets Ropes and David Wilson Thomas, Liverpool—Improvements in the application of filters to cocks, taps, or other valves used to draw off liquids. (A communication.)

WEEKLY LIST OF PATENTS SEALED.

February 20th.

1959. Thomas John Chipp and Richard Bitmead.
1966. Edward Hallen.
1969. William Racster.
1971. Alexander Moses.
1983. John Perry.
1984. Wm. Henry Perkin.
1990. Edmund Simpson.
1992. Alfred Vincent Newton.
1999. Alfred Vincent Newton.
2003. Charles Durand Gardissal.
2014. John Fletcher and William Fletcher.
2024. Manoah Bower, Richard Peyton, and Joses Weaver Downing.
2026. Matthias Edward Bowra.
2037. James Apperly.
2048. Jules Mozard.
2057. William Keates.
2058. George Anderson.
2060. William Moberly.
2065. Henry Edward Cradock Monckton and William Clark.
2068. William Smith Mitchell and Charles Martin Ernest Gartner.
2081. Charles Louis Lapito.
2101. Rd. Archibald Brooman.
2144. Richard Peyton.
2373. Jean Alexandre Labat, jun.
2558. Benjamin Goodfellow.
2906. John Aston and John Brant.
3022. William Mill.
3030. James Redgate, Edwin Ellis, and John Cropper.

February 24th.

1982. George Warriner.
1985. William Frederick Bush and William Hewitt.
2004. Charles Durand Gardissal.
2040. Joseph Lamb.
2052. Constant Jouffroy Dumery.
2080. Alfred Vincent Newton.
2186. Louis Jacquemier.
2236. Alfred Vincent Newton.
2414. George Collier.
2446. Jacques Félix Deshayes.
2890. Lodewyk Polak Kerdyk.
3060. Charles Sylvester Rostaing.
47. Louis Antoine Ritterbandt.

PATENTS ON WHICH THE THIRD YEAR'S STAMP DUTY HAS BEEN PAID.

February 16th.

394. Bashley Britten.
416. Ernest Gessner.
431. James Boydell.

February 18th.

403. Harvey Hilliard.
405. William Milner.

February 19th.

401. John Chisholm.
407. John Urie.
408. John Ramsbottom.

February 20th.

396. Nicholas Riggenbach.
432. Thomas Settle and Peter Cooper.
457. Auguste Edouard Loradoux Bellford.
544. William Clay.

February 21st.

436. Charles Walker.

PATENT ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

February 20th.

2497. John Johnson.

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

No. in the Register.	Date of Registration.	Title.	Proprietors' Name.	Address.
3946	Feb. 21.	Fumigating Apparatus for the Cure of Syphilis and Diseases of the Skin	Whicker and Blaise (late Savigny and Co.)	67, St. James's-street.
3947	" "	An Enema or Syringe	Whicker and Blaise	67, St. James's-street.
3948	" 23.	Waistcoat Shirt	Joshua E. Kellick	7, Ludgate-hill.
3949	" 25.	Anti-Garotte Cravat	Samuel Whitehall	Nottingham.